

COMPUTERWORLD

OSF changes emphasis to focus on 'middleware'

BY MARYFRAN JOHNSON
CW STAFF

CAMBRIDGE, Mass. — The Open Software Foundation is shifting its emphasis away from OSF/1 operating system development to concentrate the bulk of its resources on building distributed computing and management software, OSF President David Tory confirmed last week.

This shift in direction is certain to be discussed at the OSF's semiannual member meeting this week in Munich, Germany. Tory is trying to steer the non-profit, vendor-supported OSF into a new role as a manager of so-called "middleware" technol-

ogies developed by outside companies.

In the meantime, Digital Equipment Corp. — OSF's loudest industry cheerleader — has quietly restarted development work on its own Unix/Ultrix operating system. DEC had previously halted work on new versions of Ultrix in favor of an aggressive migration campaign to move Ultrix customers to DEC/OSF/1.

The impact of the OSF's
Continued on page 8

IBM set to outline PC revamp

Partnerships and cheaper, faster boxes key to regaining market share

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — IBM will use analyst and media briefings here this week to lay out a broadly revamped desktop and server strategy aimed at reversing a market decline hastened by smaller, nimbler competitors, according to sources close to the company.

IBM is expected to outline a refreshed and expanded personal computer family that will be delivered in stages throughout

the rest of the year, the sources said. IBM executives will tout the newly gained autonomy of the Personal Systems Group as the driving force behind the company's ability to more quickly develop and deliver competitively priced boxes.

The computer giant may also reveal intentions to move aggressively to expand its distribution channels and price its mainstream products at

levels that will compete with rising clone makers such as AST Research, Inc. and Dell Computer Corp. Analysts agreed that IBM needs to do more than just promise a new look.

"We've seen a lot of talk of the new IBM from IBM execs, without a lot of meat, and we believe that coming product moves will give us that," said John Dunkle, president of Hampton, N.H.-based market researcher Workgroup Technologies, Inc.



Tools on way to track micro packages

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Two microcomputer software giants are readying tools that will help customers more easily install and keep tabs on desktop software — tasks that are an increasing source of headaches for many information systems managers.

Lotus Development Corp. is planning to soon introduce Lynx, a software distribution management application that will provide automatic electronic distribution of programs and asset management. Microsoft Corp., meanwhile, confirmed last week that it will ship the initial version of Windows New Technology with the capability to "remotely install and monitor" software.

Lotus' Lynx will provide automatic electronic distribution of programs and asset management as well as help users better manage licensing agreements. A source close to the company said Lotus is scheduling Lynx's debut at PC Expo in New York next month.

Richard Barth, Microsoft's NT product manager, said Microsoft has not yet announced the additional capabilities needed to automate NT's installation and monitoring, "but I am suggesting it would be a pretty easy tool to write." NT is scheduled to ship by year's end.

IS managers contacted last week said they are searching for ways to improve their software management procedures, which some said are currently inadequate.

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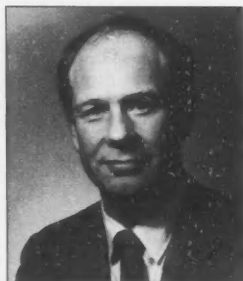
Results coming

Robert Carberry, IBM's assistant general manager of technology for the personal systems line of business, recently told *Computerworld* that IBM "was beginning to see the fruits" of its 6-month-old reorganization. He promised a broad rollout of products through the course of the year that would reflect this progress.

Among the specific ventures and products expected to be unveiled in the coming months are the following:

• IBM is expected to announce an equity and development deal

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OSF's Tory is pitching a new role for the consortium

Host software price cuts aid few customers

BY JOHANNA AMBROSIO
CW STAFF

WHITE PLAINS, N.Y. — IBM last week announced mainframe software discounts of 5% to 20% — but in so doing addressed the concerns of only its largest customers.

The new pricing program applies only to customers of the System/390 computer family who meet two criteria: They must have two or more different operating systems running on the same machine, and they

Big Blue bargains

IBM's software discount plan could save large shops a considerable amount of money. For example:

Group 40 processor running MVS/ESA Version 4, VM/ESA and a typical "stack" of software that includes DB2, VTAM and CICS:

Old price \$66,700/month

New price \$59,600/month

Discounts require two criteria: multiple operating systems running on one computer and the use of PR/SM. Non-IBM hardware and software may also qualify.

CW Chart: Michael Siggins

must use IBM's Processor Resource/Systems Manager method of logically dividing one processor into several smaller ones.

This means that only System/390 customers need apply, although some users of non-IBM hardware that have PR/SM-like

Continued on page 10

NetWare support still lacking

BY JIM NASH
CW STAFF

PROVO, Utah — A year after Novell, Inc. launched a revitalized product support program, a random survey of 25 NetWare managers revealed that most are still frustrated in their attempts to get problems resolved.

There seems to be no one culprit, as users leveled criticisms at the entire Novell support community, including resellers, OEMs and Novell itself.

A minority of those interviewed said the support they receive is good, but most acknowledged that their experiences may be skewed because their companies are active beta-test sites for Novell products. Those customers have access to internal engineering contacts that most of their peers would envy.

Novell historically has had a

bleak reputation for support. Several managers said they gave up on NetWare support years ago. Many, such as Dan Kohner,

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OpenView users to get path to OSF DME. Page 8.

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NEWSPAPER

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Companies that pirate software "are very stupid."

CHARLES WANG
COMPUTER
ASSOCIATES

On his company's latest lawsuit. See story page 4.

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COMPUTERWORLD

**NEW
for
'92**

This week, *Computerworld's* new monthly feature debuts. It will provide in-depth evaluations of complex products. New Product In-Site goes beyond the standard product review by combining extensive input from users of the new products with benchmarks and perspective from leading analysts. The foundation of New Product In-Site is the *Computerworld* Product Evaluation Council, a panel of IS managers from some of the country's largest corporations who provide detailed information on the new products they use. This first feature, found on pages 88 and 89, evaluates IBM's high-end Enterprise System/9000 mainframe. Future New Product In-Sites will showcase disk arrays, workstations, client/server software, network operating systems and more.

EXECUTIVE BRIEFING

■ **IBM's restructured Personal Systems Group** is revving up to produce a string of new PCs designed to win back market share and show that the company's woes are all over on the desktop. However, analysts are questioning if the company has restructured enough to earn consistent profits. **Page 1.**

■ **A changing role for OSF** could affect major supporters — such as IBM, DEC and HP — as the organization de-emphasizes the strategic importance of OSF/1 kernel development in favor of building distributed computing and management software. **Page 1.** As many as one in five IS departments is adopting open systems policies; while their approaches differ, they have a common goal to share data freely between among platforms. The rewards include improved productivity, less equipment and lower training costs, managers say. **Page 97.**

■ **A Computerworld survey** indicates attendees flocking to next week's Interop '92 Spring show seek standards compliance first and foremost for integrating multiprotocol networks. **Page 16.**

■ **Business users might adore their laptops, but they hate** how difficult it is for them to integrate laptop data into their desktop environments. Companies could use an environment in which connection among computers is automatic and file maintenance software tracks and updates data on all platforms. **Page 111.**

■ **IBM discounts mainframe software** prices by up to 20%, but the price break applies mostly to the largest customers. Companies have to meet conditions before signing up. **Page 1.**

■ **Ever wonder what books IS managers read for inspiration?** You may be surprised to learn they are turning to historical leaders such as Attila the Hun and learning from the mistakes of a failed Antarctic explorer. **Page 122.**

■ **Lotus is planning to release tools** that better manage desktop software distribution and upgrades. Meanwhile, Microsoft says Windows NT will have some built-in capabilities to remotely distribute and monitor desktop software. **Page 1.**

■ **CA filed suit** against First Fidelity for breach of licensing agreement and misappropriation of trade se-

crets. **Page 4.** It also announced plans to acquire Nantucket Corp., a developer of desktop database tools. **Page 4.**

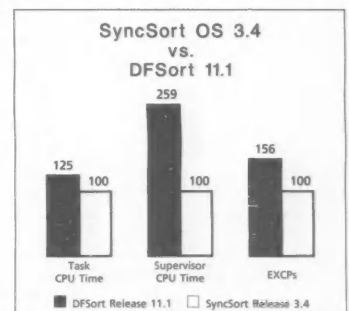
■ **SPSS**, maker of the venerable statistics package, has brought a full-featured version of its software down to the PC in a graphical environment. **Page 59.**

■ **Experience with NCR's Cooperation** client/server environment shows that such cooperative processing can be beneficial, but it can also mean more work than users anticipate. **Page 91.**

■ **On site this week:** Everything changes, and baseball is no different. First the game gave in to artificial turf, and now the company that produces the Louisville Slugger bat is ready to switch from a proprietary mainframe to open systems. **Page 81.** Amoco Canada's move from a mainframe to a LAN-based system ran into a roadblock when data overwhelmed disk capacity. The company brought in a storage server to give workstation users immediate access to their data. **Page 65.** Six months down the runway, United Airlines has found that its client/server-based crew scheduling application is accomplishing what it hoped for, though some issues — such as security — have presented challenges. **Page 68.** The newest big eye on the sky is in Hawaii, where microprocessors on high-speed networks control the precise positioning of the Keck Observatory telescope's massive mirror complex. **Page 71.**



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CA sues bank on piracy charges

BY THOMAS HOFFMAN
CW STAFF

NEWARK, N.J. — Computer Associates International, Inc. last week sued a major Northeast regional bank holding company, claiming it illegally used CA software managed by outsourcing provider Electronic Data Systems Corp.

The suit, filed in federal court here, charges First Fidelity Bancorp with breach of software license agreements and misappropriation of trade secrets, among other things. CA would not state what software programs are in question. EDS is not being sued under CA's complaint.

CA claimed the bank admitted to the allegations last October. A spokesman for First Fidelity would not acknowledge that, however, and said CA's claims are without merit. First Fidelity has filed counterclaims against CA, the spokesman added.

First Fidelity is CA's latest legal entanglement. The \$1.4 billion software vendor is already in court with EDS and its parent, General Motors Corp. — and two other mainframe software

customers — over the transfer of software licenses. The two earlier suits involve State Street Bank and Trust Co. and National Car Rental System, Inc.

Officials at both CA and First Fidelity, which has \$29 billion in assets, provided few details on the circumstances that led up to the lawsuit. However, CA Chairman and Chief Executive Officer Charles Wang said that the First



CA's CEO Wang: Firms that pirate software 'are very stupid'

Fidelity lawsuit, like other lawsuits CA has filed since January, comes down to one issue: software piracy. Companies that pirate software "are very stupid," Wang said.

Industry observers said they believe users should take note of such legal actions by CA. "They'd better be concerned, and they'd better be paying attention ... [because] there's too much money on the table to ignore this," said Arthur Gillis, president of Computer Based Solutions, Inc., a New Orleans-based management consulting firm.

The action appears to be yet another arrow slung by CA in its legal battles with EDS. EDS first sued CA in January, citing breach of contract, among other things. CA quickly countersued for \$2

billion, accusing the outsourcing firm of software piracy and fraud.

EDS has worked with First Fidelity since September 1990, when the two companies signed a \$450 million, 10-year contract. Under that agreement, EDS took 18 months to consolidate operations from two data centers to one facility in Philadel-

phia. EDS has hired 300 former First Fidelity employees to help run the operation.

In addition, EDS is assisting First Fidelity's information systems staff in integrating the operations of 530 offices in New Jersey and eastern Pennsylvania under one common operating environment. The outsourcer will also build a standard operating

environment for eight First Fidelity affiliates during an 18-month period.

Since signing on with EDS, First Fidelity has acquired six banks and/or branches. EDS has since created a common environment for nine affiliates, with plans to complete the project with five other branches by September.



Keeping it legal

Outsourcers and software vendors agree there is a problem with their relationship but do not necessarily agree on a way to resolve it. In the meantime, unwary users may continue to get caught in the crossfire.

That was essentially the upshot of an open-mike session in New Orleans at last week's annual meeting of the Information Technology Association of America (ITAA), an organization formerly known as Adapso.

At issue is how outsourcing firms can legally and ethically take over their clients' software licenses in a way that fairly compensates the software vendor.

During the let-it-all-hang-out session, which occasionally flared into angry exchanges, John Landry, executive vice president at Lotus Development Corp. in Cambridge, Mass. — representing the software vendor's side of the issues — said, "licensing is a very serious and multifaceted issue. Each company has a slightly different perspective."

The biggest fear of a software vendor is that

an outsourcer could, theoretically, take over a user's site license and use it to process other clients' jobs. A recent ITAA survey showed that 53% of the software vendor respondents prefer a royalty method based on revenue when licensing software to outsourcers.

On the other hand, a separate survey of outsourcing vendors showed that they prefer, by 75%, a site license. "What about a 4381 shop who turns over to an outsourcer running on a 600J an application used by just that one shop?" asked James Heigl, vice president at Litton Computer Services in San Jose, Calif. "The software vendor then wants us to upgrade to a 600J price," although nothing has really changed except the processor, he said.

One user who knows firsthand the frustration this argument can bring is John Livingston, chief information officer at National Car Rental System in Minneapolis. He said he "got caught in the middle of the CA/EDS lawsuit, and we still have negotiations going on with CA. I'm just tired of the whole thing."

JOHANNA AMBROSIO

CA to acquire Nantucket in bid to boost PC sales

BY THOMAS HOFFMAN
CW STAFF

ISLANDIA, N.Y. — Computer Associates International, Inc. last week signed a definitive agreement to acquire Nantucket Corp., the \$40 million developer best known for its desktop database development environment. Terms of the agreement were not disclosed.

The move is intended to help CA improve its standing in the \$10 billion personal computer software arena, an industry market in which CA's share is negligible, analysts said.

About 10% of the company's \$455 million in revenue for the third fiscal quarter ended Dec. 31, 1991, was PC software-related, according to Sanjay Kumar, CA's senior vice president of planning.

CA's move follows by two months Microsoft Corp.'s agreement to acquire Fox Software, Inc., one of Nantucket's competitors in the PC database management software world.

Nantucket users expressed mixed feelings about the acquisition.

"Retaining the development people at Nantucket would be my major concern," said Kyle Capps, manager of microcomputer applications support at the University of North Texas in Denton.

But, Capps said, the acquisition could help Nantucket speed up development of products, which he said has historically been slow.

"They have a bad reputation for being slow to come out with products, and I hope CA can address that in the future," he said.

Future unclear

CA executives said they expect Nantucket's development team to remain intact, though no decisions have been made as to the future of Nantucket's executive team and the firm's 260 employ-

ees. Also unclear is how Nantucket's Clipper products will be integrated with CA's CA-dBaseFast, its dBase development language for Microsoft's Windows. "Those are all issues we'll work with the Nantucket group on," said Charles Wang, CA's chairman and chief executive officer.

Larry Heimendinger, Nantucket's president and chief op-

er environments for users of Clipper applications.

Kumar pointed out that Aspen technology could be used to build graphical user interface database applications for IBM's OS/2 2.0 — an environment in which CA customers have shown renewed interest — and Unix.

"Unix is a key platform, just as Windows is a key platform," Wang said.

CA and Nantucket executives would not comment on the availability of Aspen-based products.

However, Heimendinger said Nantucket plans to generate revenue from these products in fiscal 1993, which begins July 1, 1993.

The acquisition could give CA a second chance at the mainstream PC software market. Its first stab — its acquisition of Super-

CALC — has not brought the company much market presence. "CA has been pretty inept at tackling the PC software industry," said Rich Finkelstein, president of Performance Computing, Inc., a Chicago-based data-

base consulting firm.

Nantucket's inability to ship products on time — though it has some 300,000 Clipper licenses — made it an easy target for CA, Finkelstein said.

Nantucket, like many smaller developers, is constantly confronting cash-flow problems, which should be alleviated by CA's deep pockets, he noted.

Not budging

But the deal has not changed Finkelstein's mind about CA's PC software strategy. "CA has no understanding of the PC marketplace. They just talk a different language," he said.

CA executives declined to elaborate on their PC strategy, saying they did not want to tip off competitors on where they will spend resources.

Others in the PC software community said they believe the acquisition has merit.

"It makes sense, considering what they're trying to do to support multiple platforms while adding to their PC software products," said Nancy Leslie, a senior systems analyst at Gulfstream Aerospace Corp., the Savannah, Ga.-based manufacturer of the Gulfstream Jet who is both a Clipper user and a customer of CA software.

At a glance . . .



Founded: 1984.

President and COO: Larry Heimendinger.

1991 revenue: Approximately \$40M.

Profit: Information not released.

Employees: 260.

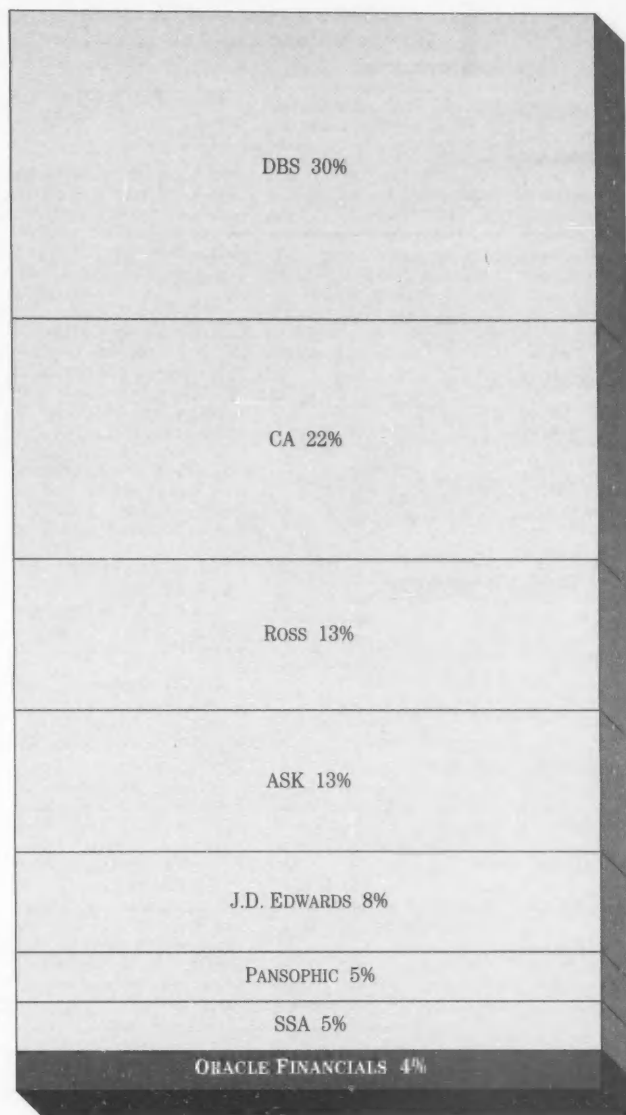
Product line: Clipper (installed base: 300,000); Nantucket Tools (shipped September 1991); Matt Whelan's Compiler Kit (just released).

CW Chart: Michael Siggins

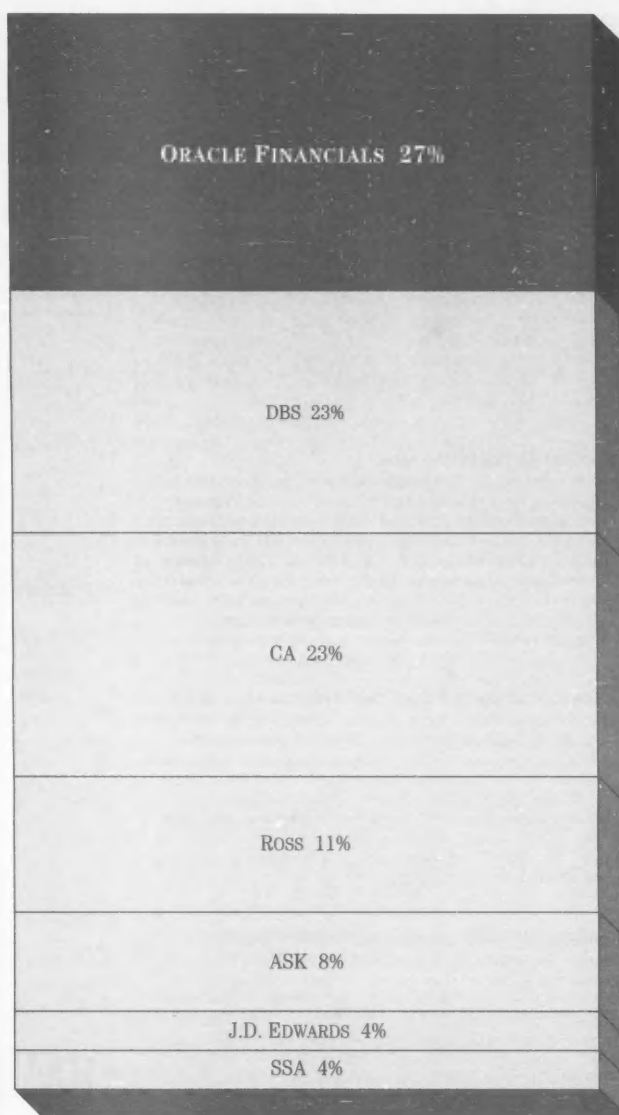
erating officer, said he believes that Aspen, a next-generation, object-oriented Clipper product that is now in development, will be marketed as "complementary" to CA-dBaseFast.

Aspen will provide graphical front ends into Windows and oth-

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NEWS SHORTS

Mixed bag at OSF meeting

The Open Software Foundation will have some good and bad news this week for its 340 member companies. The good news: availability of the first developer's "snapshot" of Distributed Management Environment software, a multivendor management system slated to become an industry standard. The bad news: an indefinite delay in the Architecture-Neutral Distribution Format (ANDF), which promises to free applications from platform dependence. The European Community's Esprit project will take over ANDF development, aided by a single U.S. government research laboratory.

Did they or didn't they?

Ing. C. Olivetti & Co. reported last week that McDonald's Corp. had tapped it to supply more than \$300 million in advanced point-of-sale systems for its 12,000 restaurants worldwide. The Olivetti system reportedly uses Intel Corp. 80386-based personal computers featuring flat-panel, touch-screen displays connected to Unix servers. But McDonald's rejected Olivetti's claim that it will install 50,000 workstations at 8,800 U.S. McDonald's outlets during the next 10 years. McDonald's said it did add Olivetti to an "approved suppliers" list.

Cisco branches out

Cisco Systems, Inc. last week took strides to accommodate remote sites with telecommunications services limited to the dial-up telephone network. It announced a \$129-per-port replacement for its stand-alone terminal servers. The replacement is said to enhance terminal serving by adding an asynchronous Internet Protocol (IP) router for creating a dial-up IP router network; translation services between devices running the full array of virtual terminal protocols; and support of serial-line protocols for laptop and X terminal users.

Perot nabs \$1B in outsourcing pacts

Herndon, Va.-based Perot Systems Corp. said it recently signed two European outsourcing contracts worth a combined \$1 billion. Under a 10-year deal with Paris-based Europcar, Europe's largest car rental company, Perot will move Europcar from its IBM Enterprise System/9000- and 3090 300S-based operations into Unix platforms scattered around 1,000 sites. A 12-year deal with UK-based East Midlands Electricity calls for Perot to take over the company's Amdahl Corp. 1400A-based data center.

Infonet 'the very best' for Nestle

Nestle SA has selected Infonet Services Corp. to interconnect disparate electronic-mail systems implemented at the food company's sites in 80 countries. Infonet will also provide translation among incompatible E-mail systems. Nestle's long-term E-mail goals include reducing fax and telex costs by 30%, migrating to CCITT X.400, implementing electronic data interchange links with business partners and boosting the current 6,000 mailboxes to 60,000 during the next three years.

Short takes

Amdahl promoted President Joseph Zemke, 51, to chief executive officer. He succeeds John Lewis, who will stay on as chairman. . . . Siemens AG will buy out IBM's 50% share in Rolm Co. . . . Concurrent Computer Corp. named John T. Stihl as president and chief operating officer. . . . University of California Lawrence Livermore National Laboratory will head a three-year effort to speed data transmission between storage devices and supercomputers. Called the National Storage Laboratory, its goal is to combine commercial hardware and software to achieve data transfer times of up to 400M bit/sec. . . . IBM intends to preinstall OS/2.0 across its Personal System/2s and started with Models 56 and 57 last week. . . . IBM, Apple Computer, Inc. and Motorola, Inc. dedicated a design facility that will produce the trio's PowerPC family of single-chip reduced instruction set computing microprocessors.

More news shorts on page 16

Travel system delayed til '93

Car/hotel/airline reservation network experiences compatibility snafu

BY CLINTON WILDER
CW STAFF

DALLAS — Admitting that it bit off more than it could chew, a major travel industry partnership has announced an 18-month delay in the rollout of its vaunted reservations system after more than three years of development work.

The International Reservations and Information Consortium (Intrico), which oversees the development project, discovered major problems earlier this year when the system was beta-tested at Hilton Hotels Corp., one of four consortium members. The system's first phase, part of what was once billed as a \$50 million project, was supposed to be ready in the current quarter; instead, it will roll out at the end of 1993.

Beta-test users at Hilton found that the system's three major components — user interface, mainframe transaction processor and mainframe database — did not adequately communicate with each other.

Integration solution

Confirm, developed by consortium partner American Airlines' division AMR Information Services, Inc., has been billed as the first system to fully integrate hotel, rental car and airline reservations. Other members of the Intrico partnership, formed in late 1988, are Marriott Corp. and Budget Rent A Car Corp.

"In 20 years in the business, this is the most complex integration challenge I have ever seen," said Charles Biebighauser, vice president of operations at Intrico. "We had 500 technical people working on this, so the chance for miscommunication was fairly large."

"IN 20 YEARS IN the business, this is the most complex integration challenge I have ever seen."

CHARLES BIEBIGHAUSER
INTRICO

Confirm runs on two IBM 3090 mainframes, one housing the central reservations system in a Transaction Processing Facility environment, the other running an MVS-based DB2 database containing decision support information such as customer histories and marketing analysis. The database contains



batch reports and on-line updates of such information as hotel rates.

The system depends on application-to-application bridging between the CPUs for some 60 applications, which was a far more difficult challenge than anticipated, Biebighauser said. "We must make sure everyone is coordinated in terms of the internal transactions — who handles them, when does the operating system get involved and when does the application get involved," he said.

Intrico uses Texas Instruments, Inc.'s Information Engineering Facility (IEF) automatic

code generator to write the MVS-based code, but it ran into problems using IEF to develop the proprietary teleprocessing monitor front end that it calls Transaction Management Facility.

"IEF will not generate the right code that we need to make that [front end] work correctly, so we have to replace some of that," Biebighauser said. "That is another fairly substantial integration problem."

The front end will also interface with the five major airline reservations systems and all user terminals and management systems that run in customers' hotels.

Biebighauser said Intrico will not add more people to the development project but will bring in more experienced managers from AMR Information Services.

He noted that Confirm's original four-phase, nine-month rollout schedule would be compressed once the first phase is ready late next year.

A Hilton spokeswoman said that the firm plans to forge ahead with its own internal reservation systems and does not believe there will be any negative effect from the Confirm delay.

A spokesman for Budget Rent A Car said the firm was "disappointed with the delay but recognizes that the development of a system like this requires considerable work."

IBM doubles number of Plug'N'Go applications

BY KIM S. NASH
CW STAFF

WHITE PLAINS, N.Y. — IBM doubled the number of turnkey solutions available for entry-level Application System/400 E series models last week. The move filled a few application category gaps, but the packages are aimed mainly at small business niche users and value-added resellers.

Fifty vertical applications, sold either individually or bundled with AS/400 9402 Model E02 or Model E04 machines, are now available under IBM's 8-month-old Plug'N'Go program.

IBM also announced that users can order WordPerfect Corp.'s flagship word processor preloaded with bundled setups.

The shrink-wrapped Plug'N'Go scheme is not a primary mover of AS/400s but is a response to demands from small customers, such as parking garage agencies and property managers, said Dan Mersel, manager of the program. He declined to provide sales figures.

High volume, low profit

"These turnkey solutions are not insignificant, but they are very low-end products," said Bill

Sines, director of midrange strategies at Technology Investment Strategies Corp. in Framingham, Mass. That means that while the number of units sold may be high, the dollar count is relatively low, he explained.

Among the new offerings are accounting, public sector and distribution packages written by third-party software developers. Plug'N'Go System Solutions, which come with a 90-day money-back guarantee, are bundled packages that include a vertical application, an E02 or E04 machine, OS/400, Personal System/2s and other peripherals and utilities.

Prices start at \$24,000 for the new offerings. New individual Plug'N'Go Application Solutions range from \$1,295 to \$19,500.

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OpenView promises to deliver

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week announced OpenView 3.0, a new version of its OpenView network management platform said to provide users with a smooth migration path to the Open Software Foundation's (OSF) Distributed Management Environment (DME). It is slated to ship in June.

The announcements put HP ahead of competitors and OSF co-founders — such as IBM and Digital Equipment Corp. — when it comes to providing a truly open network management platform, said James Herman, principal consultant at Northeast Consulting Resources, Inc. in Boston.

"HP is acting like a vendor who's in this multivendor network management business to stay," he said, noting that HP is making long-term commitments and supporting OSF protocols that users and vendors have so far resisted adopting.

Users seem to be responding to OpenView's openness: The system now has 8,000 end-user licenses, a 49% growth in the

last five months compared with the last three years, an HP spokesman said.

Few end-user companies have actually committed their network and systems management strategies to DME. "It's hard to be committed to DME when there are no products," said Robin Layland, manager of Systems Network Architecture (SNA) software engineering at The Travelers Corp. in Hartford, Conn.

Drawn by promises

However, several network managers in Fortune 500 companies have expressed a strong interest in what DME promises to provide: the ability to manage a wide range of networked systems via a broad range of third-party network management applications and a common graphical user interface (GUI).

Travelers, for example, wants to use IBM's NetView/6000 — which is based on HP's OpenView — as an integrated management system for its local-area network and LAN interconnectivity devices, Layland said. However, IBM needs to incorporate additional OpenView elements as well as DME

capabilities into NetView/6000 before the product can support Travelers' full range of networking products, Layland added.

HP's OpenView 3.0 announcement, due out next month, incorporates a common, DME-compliant GUI based on specifications that HP submitted to OSF. It also provides Simple Network Management Protocol (SNMP)-based management services.

This week, HP will announce an OpenView SNMP developer's platform and tool kit that third-party developers can use to tie their packages to the above services and DME-compliant GUI. Independent software vendor products that are written to OpenView 3.0 can migrate with "minimal changes" to full DME compliance once the standard is finalized, HP spokesman Jeff Thieman said.

HP will also unveil OpenView Network Node Manager, which provides the above capabilities as an end-user application, priced at \$15,000. Both offerings are slated to ship in June.

Also this week, HP will announce OpenView Management Platform Release 3.2. Scheduled to ship in the third quarter, the

Points to ponder

DME can be summed up by the following points:

- Common GUI across different network management applications and services.
Benefit: Network managers can use the same windows-based GUI to invoke a range of management functions and applications.
HP support: June 1.
- Consolidated application interface.
Benefit: Manage a wide range of networked systems via either the OSI-CMIP or SNMP.
HP support: Third quarter.
- Object-oriented application interface.
Benefit: Automated administration and management of multi-vendor "objects" such as network devices, systems, applications, files and databases.
HP support: No time frame.

platform will provide the following capabilities:

- Distributed Management Platform, which is said to support distributed SNMP-based management services across multiple management stations.
- Support of the DME Consolidated Management application programming interface, which enables one application to manage network systems that comply with either SNMP or the Open Systems Interconnect Common Management Information Protocol, HP said.

• Optional support of SQL-based databases that can later be used to collect network management data for reporting and analysis.

HP also announced that about 60 additional third-party packages now support OpenView. One notable newcomer is OpenSNA from Peregrine Systems, Inc. in Carlsbad, Calif. Slated to ship by midyear, the product is said to tap IBM's VTAM for SNA management data and feed the data to an OpenView management server. Pricing was not available.

OSF changes focus to push middleware

CONTINUED FROM PAGE 1

changing role is unclear at this stage. Tory is still drumming up support among major sponsors such as DEC and IBM, who are being asked to provide more of the future development work on OSF/1. "It's a shift from OSF being the engineer, to being more of the project manager," said Donna Van Fleet, personal systems director of programming at IBM. "It seems to me to be a very natural evolution."

Another priority for the member companies is OSF's continuing work on microkernel technology, which will eventually enable a single kernel portable to many different hardware platforms. "We don't want OSF to back off the kernel," Van Fleet said. "We are very much in agreement on continuing investment in the microkernel," she said.

Kernel truce

Several industry analysts said OSF's changing emphasis signals the end of the Unix kernel wars, with AT&T's Unix System V Release 4 operating system emerging as the victor.

"OSF has to find a face-saving way to step away from OSF/1 because System V Release 4 is the preferred kernel," said Kate Fessenden, an analyst at Meta Group, Inc. in Westport, Conn.

OSF plans to hang its future

on development of the Distributed Computing Environment (DCE) and Distributed Management Environment (DME) software technologies, considered middleware that sits between the operating system and the applications.

"No one cares what the kernel is anymore. All of our layered technologies are increasingly hiding the operating system," Tory said. "The customer definition of open systems is interoperability over multivendor environments."

Many users seem to agree. "My main interest is in DCE and DME rather than operating system areas," said Duane Elms, program manager of technical computing at General Electric Co. in Fairfield, Conn.

At John Hancock Financial Services in Boston, a corporate membership at OSF is being considered because of interest in DCE and DME, said Sally Atkins, a consultant in technology directions and research.

Bill Conley, manager of information technology services at Loral Aerospace Corp. in Newport Beach, Calif., added, "The original reasons for OSF's creation have kind of gone away, but in the meantime, they've done some really neat things like DCE."

Users will also start noticing

more solid evidence of true cooperation between OSF and its onetime archenemy, Unix System Laboratories, Inc. (USL), which markets Unix System V Release 4.

Last week, Summit, N.J.-based USL announced how it will incorporate the OSF's DCE into its own plans as a reference implementation to run on System V Release 4.

USL's general direction these

days "is to deliver product implementations of OSF technologies," said Joe Menard, director of marketing at USL. Both OSF and USL are working on a single specification for a common set of application programming interfaces that will essentially unify the two operating systems.

"That is really incredible and a very positive step," Atkins said.

While OSF has always subcontracted or farmed out some of the technical work on OSF/1 and other software projects, the

proportion of outside work has been climbing steadily over the past year, Tory said.

A variety of member companies, such as IBM, Groupe Bull, DEC and Siemens/Nixdorf Information Systems, Inc., do the actual work. IBM, for example, is the master integrator for the eight software technologies included in DCE.

Analysts give OSF high praise for coalescing the major industry players around standards and producing some widely accepted technologies, such as the Motif graphical user interface.

DEC renews interest in Ultrix

"You got the wrong one, baby. Uh huh!"

That twist on the popular Pepsi commercial was one jokester's way of summing up how DEC must feel as the OSF de-emphasizes its development role in the OSF/1 operating system.

DEC's plan to introduce a full-scale production release of DEC/OSF/1 this summer has been pushed to later this year, company officials said, although plans to run OSF/1 on the next-generation Alpha systems are still in place. The Maynard, Mass.-based vendor is unhappy about the shifting ground under OSF/1, however.

"There has been a lot of discussion about this," said Glenn Johnson, group engineering manager for the open software program office at DEC. Johnson also sits on the OSF's board of directors, which he said "feels strongly" that development of OSF/1 must continue.

If OSF/1 does not evolve at a satisfactory rate, Johnson said, DEC could continue the

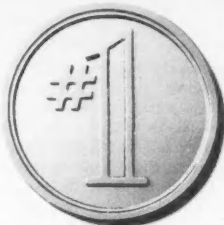
work in-house with its own resources. Eventually, DEC would merge the Ultrix and OSF/1 Unixes into one product, he added.

As for the new version of its own Unix variant, Ultrix, DEC officials insisted that customer demand reversed their decision to sideline Ultrix in favor of OSF/1.

Ultrix will now be ported to the Mips Computer Systems, Inc. R4000 chip for the next hardware upgrade of DECstations and DECsystems, which are scheduled to ship this fall. The Alpha platform will still offer a choice of three operating systems: OSF/1, Windows New Technology and Open VMS.

"DEC can't afford to wait" for a production-class version of OSF/1, said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. He and other analysts pointed out that OSF/1 still lacks stability and robustness.

MARYFRAN JOHNSON



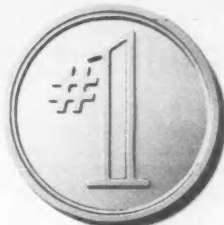
Largest worldwide
RDBMS market
share: 30%
-Gartner Group



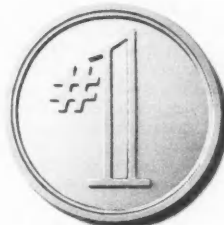
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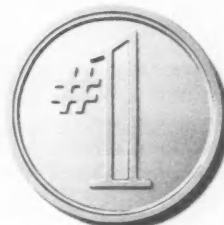
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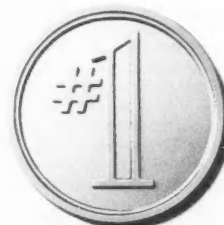
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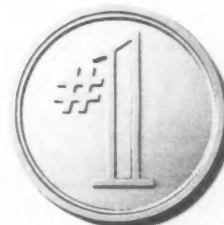
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Host software price cuts aid few

CONTINUED FROM PAGE 1

capabilities, including those with Amdahl Corp. processors, are also eligible.

Customer and industry reaction to the plan was mixed. While customers said they are relieved to get some pricing breaks from IBM, other observers pointed out that the plan applies to only a small percentage of IBM mainframe customers and does not replace the tiered pricing model that is the basis for many users' pricing-related complaints.

Richard Goldberg, assistant general manager of software marketing at IBM North America, acknowledged that the discounts apply to only 5% to 10% of

IBM's customer base, including some of IBM's largest users. But, he said, "this may [inspire] customers to consolidate" two or more existing operating systems onto one large computer, thus making them eligible. "We're anxious to see what actions they take."

Wide application

"This could apply to several of our sites," said William Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y. "Obviously, we would welcome it because we'll take everything we can get. But the essence of the prob-

lem remains the built-in tier creep that is an impediment to augmenting our [mainframe] capacity."

Nevertheless, Goldberg defended the discounts as "a meaningful response to our customers who have asked us to do something." He also said IBM will "continue to work" on other pricing changes, including those designed to allow customers to pay for software based on the portion of the total processor complex that it consumes [CW, March 2].

Goldberg characterized this as "Splex" pricing, referring to the IBM Splex idea that allows customers to link multiple computers together and run them as one giant complex. Goldberg would not say when this pricing scheme would be introduced.

Robert Delaney, vice president at the Principal Financial Group in Des Moines, Iowa, said the new pricing plan does not apply to his shop. However, he said he is looking forward to the Sysplex-based scheme. "That's a very attractive environment to me," Delaney said.

In the meantime, the new pricing plan — called Multiple Operating System-PR/SM — will turn up as another column on IBM's pricing sheet. Users can run any two of IBM's host-based operating systems, including MVS, VM, VSE, AIX and TPF. To be eligible, customers need to sign a document stating that they use PR/SM.

Still, some industry watchers were skeptical. "This is not a pricing announcement as much as it is a way of making customers' commitments to multiple operating systems as inexpensive as possible," said Curt Monash, editor of the "Monash Software Letter" in New York.

Charles Wang, chairman at Computer Associates International, Inc. in Islandia, N.Y., said IBM's plan "affects very few of [CA's] users at this point." He contrasted it with CA's more sweeping price changes a few weeks ago [CW, April 20]. Still, he acknowledged, "Every time you listen to clients and respond, you do some good for the computer industry."

It is also not certain how the third-party software vendor community will respond, if at all.

Although IBM's announcement of the tiered pricing scheme in 1986 led an industrywide movement toward that model, it is less clear that IBM will signal the charge this time around. Other vendors have already started to adopt different kinds of pricing strategies.

Ian Durrell, vice president at SPSS, Inc. in Chicago, said "IBM's pricing announcements are not appropriate" for his firm, which charges for its statistical applications based on the operating system under which they run. Cyborg Systems prices its human resources package, which runs on the System/390 and other platforms, according to the number of employees in the user organization.

Not everyone is convinced that IBM will fundamentally change the way it charges for high-end software.

"They will never abandon tiered pricing completely because it's a matter of survival," said Warren Culpepper, president of the Atlanta-based consulting firm that bears his name. "Like many mainframe software vendors, they make more money from CPU upgrades than they do from new licenses."

CORRECTIONS

A story in the April 27 issue incorrectly referred to components used in IBM's Enterprise System/9000. The technology should have been called thermoelectric modules.

A story in the March 9 issue about FDDI over copper wiring said that standards committee work with plastic fiber was nearing completion. That work reportedly is being done with lower-cost glass fiber alternatives. An estimate in the article about current copper wiring installations attributed to standards committee vice chairman Floyd Ross should have said that by the time an FDDI standard for shielded copper wiring is complete, it should satisfy 80% to 90% of the demand for 100M bit/sec. networking.

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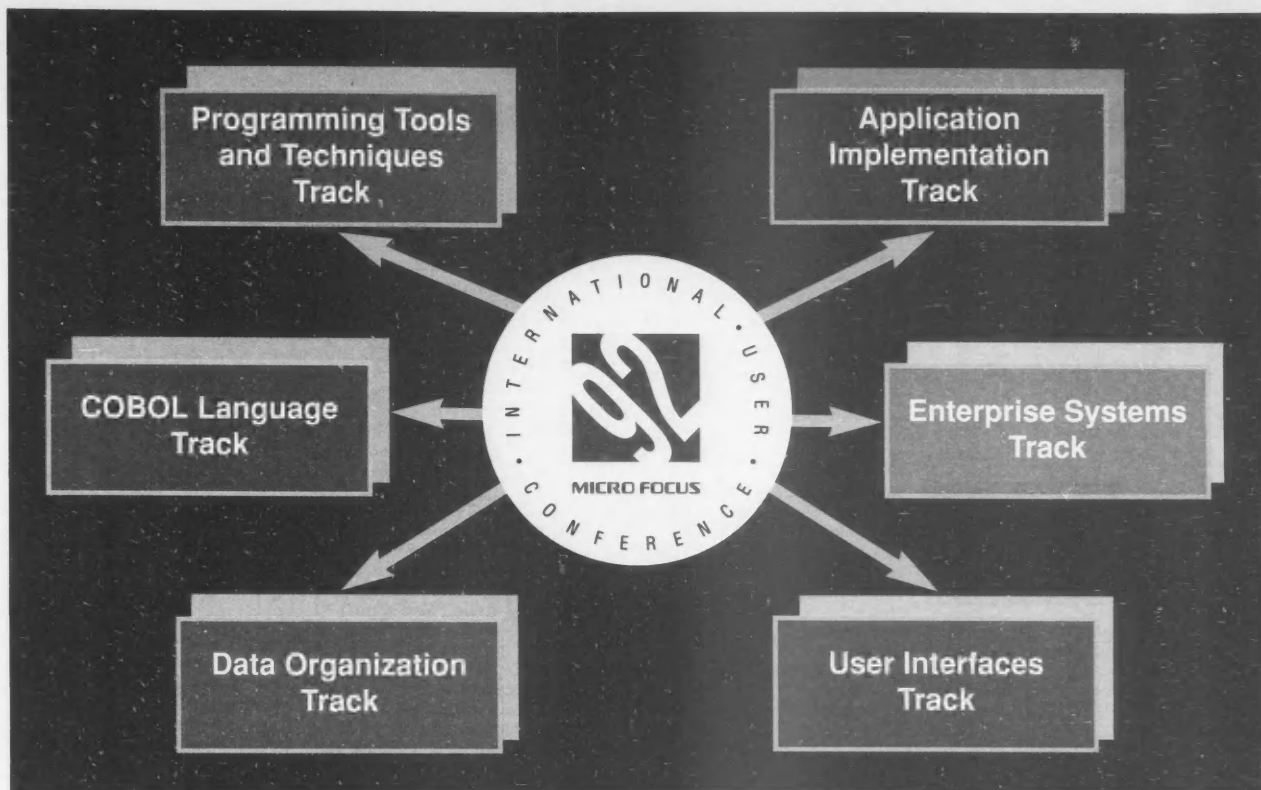
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IBM set to outline PC revamp

CONTINUED FROM PAGE 1

with superserver maker Parallax Computer, Inc. in the next two weeks [CW, April 20]. This will lead to joint development of two or three new multiprocessor-based servers, each configured around two to four Intel Corp. processors.

Some of these systems will use a new 64-bit data transfer version of Micro Channel Architecture (MCA).

● IBM will boost the Model 95 server line by adding Intel's unannounced

33/66-MHz DX2 processor during the summer; later it will add in the P5 processor, which sources said will come from Intel in late August.

● An expanded high-end Personal System/2 strategy will see MCA-based PS/2s that use Intel's coming 33/66-MHz DX2 chip and the P5 as well as future versions of IBM's SLC chip.

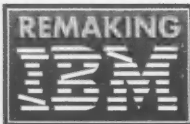
● An expanded lineup of PS/2s that use the AT bus is expected. IBM will expand the midrange of the line in the fall to include products based on its unannounced 1486SLC chip. Less clear is whether IBM will use Intel 486 chips in its midrange line.

Most observers said that if Northgate Computer Systems, Inc. becomes an IBM subsidiary, its offerings will become the Intel-based, AT bus midrange lineup for IBM, with IBM's SLC being used for the PS/2.

● IBM will expand the PS/1 into a full-fledged family, including

notebook and laptop systems. This move will be topped off with the late-year announcement of a desktop unit based on the 25-MHz 486SX chip.

IBM is expected to continue to expand its notebook product line as well — both through agreements with Zenith Data Systems and through its own efforts, which are expected to include a midyear announcement of a color notebook and a variety of enhancements.



These range from bigger hard drives to faster processors — particularly faster versions of IBM's own SLC chip — for its ex-

isting notebooks in late summer and the fall.

IBM executives have given some indications of this strategy already, saying that the company intends to widely use its SLC chip in its product line and plans to release new PC products virtually simultaneously with Intel chip announcements, though the company refused to comment on specific plans.

More bundling

Some sources said a desire to spread OS/2 as broadly as possible was driving moves such as the expansion of the PS/1 line to the 486 level.

IBM has said it intends to bundle OS/2 throughout its product line and last week began packaging the operating systems with PS/2 Models 56 and 57.

Analysts agreed that IBM, which has sold 13.9 million PS/2s since the line was introduced in 1987, must continue its push toward pricing its products competitively with clone makers. IBM has made significant strides in reducing prices, but most observers said its pricing must still improve.

"Our bigger concern is whether [IBM and Compaq] are going to produce workstation and desktop products that are going to be price-competitive with Dell and Gateway. They tell us they are, but the proof is in the pudding," said William Tauscher, chairman of ComputerLand Corp.

Talk is cheap

"They talk stuff, but I haven't seen anything solid yet," said Robert McGoughlin, assistant vice president of PC procurement at New York Life Insurance Co. "It takes time, I know, but I haven't seen the actual changes yet. I'll be optimistic and say they're coming."

Sources agreed the new IBM was coming but said it might have a high price.

Peter Kastner, vice president at the Aberdeen Group, a Boston-based consultancy and market research firm, said he sees more bottom-line troubles.

"Even Apple, which dedicated itself to this model, needed a year and a half of decreasing margins and cutting expenses," Kastner said. "The implication for IBM being: more restructuring."

IBM adds programs, cuts OS/2 kit pricing

BY CHRISTOPHER LINDQUIST
and MARK HALPER
CW STAFF

SAN FRANCISCO — In an effort to bring more developers into the OS/2 fold and keep current developers content, IBM recently unveiled more than 25 programs and dropped the price of its development kit by more than 60%.

The temporary price reduction on the IBM C Developer's Workset/2, from \$895 to \$295 starting May 19 and in effect until Sept. 5, was a highlight of the OS/2 2.0 International Tools Conference held here last week.

The cut brings the OS/2 kit pricing closer to the \$139 Windows 3.1 and C/C++ 7.0 offer being made by Microsoft Corp.

Mark Pelt-Layman, a developer at Enterprise Software Corp. in Los Angeles who had complained of IBM's pricing for its developer tools, said he was happy with the price cut. "I'll take it at [\$295]," he said.

Pelt-Layman was but one of many developers who had wanted to see improvements in IBM's support of software developers. Developer complaints had ranged from the high price of tools to difficulty getting answers from IBM support staff

[CW, April 27]. The new programs may help assuage those developers.

Among the programs announced were the following:

● Additional technical support via the CompuServe, Inc. CompuServe information network, including an increased number of support areas.

● Enhanced 32-bit application development support, including direct MCI Mail links to IBM's technical support staff.

● A series of week-long development workshops.

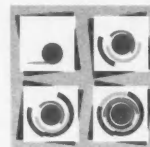
● A "Corporate Customer Tour" aimed

at demonstrating OS/2 to information systems management and end users.

IBM acknowledged that it was lacking in some areas of support — particularly electronic support. "IBM has not been known as being the most accessible company in the world," conceded Brian Profit, an IBM senior programmer.

"We've been staffing CompuServe with a sort of volunteer army since June. Now it's an official service vehicle," Profit added.

Pelt-Layman indicated, however, that IBM's presence on CompuServe certainly left room for improvement. "The CompuServe support is a joke," he said.



Tools on horizon to track PC software

CONTINUED FROM PAGE 1

"This is a tremendous issue for us," said Joseph Herrin, director of systems development at Joseph E. Seagram & Sons, Inc. "We attempt to keep an inventory, but that's really difficult, as users move around and machines change hands."

Industry analysts said software management is an increasingly critical issue because of the mix of operating platforms and the various versions of applications installed. It can make a nightmare out of the task of delivering software, coordinating upgrades and then upholding the various licensing agreements.

"This is an area where there is really a need for good products," said Frank Michnoff, a program director at Meta Group, Inc. "Users are upgrading applications en masse, like when they move to Windows. Furthermore, they are downloading in-house code and dis-

tributing it down to the desktop. There's a tremendous need to manage all this."

Price Waterhouse claims it has been hounding its vendors to bring it some relief by providing this kind of technology.

"We were one of the people who yelled at [Lotus] to do this," said Sheldon Laube, national director of information and technology at Price Waterhouse. "We do it by hand, [and] what we

do now just doesn't work," he said of the firm's software management efforts. "No way in an organization with 11,000 PCs can you easily manage the software."

According to users and analysts, the Lynx software will tackle the following issues: distribution management to over-

see the electronic shipment of either an upgrade or new software; version management to keep better tabs on the various releases of a particular program; and asset management to allow managers to maintain data on what software is being used and where it is installed.

In addition, observers said, the software could assist users on licensing. More data will make it easier to "stay within the letter of the law," said Stuart Woodring, an analyst at Forrester Research, Inc., based here.

"One of the corporate nightmares is to make sure you are in compliance with your licensing agreements," said Ronan McGrath, vice president of IS at Canadian National Railway Co. "We spent a lot of time trying to make sure we are in compliance. Having a system to centrally manage this would give us a greater level of compliance."

Canadian Railway has set up a central function to keep track of software upgrades and versions. However, it still physically installs the applications. "This is cumbersome," McGrath said, "but it's how we do it today."

Notes distribution goes electronic

Lotus launched its first official Notes electronic distribution channel earlier this month when it introduced its Notes Application Library.

The company provided the library — a set of 50 applications — on a Notes server at its Cambridge, Mass., headquarters and allowed users to dial in, pick up the software and download it to their Notes servers.

The plan is to eventually give users access to various Notes updates and services in what amounts to a server-to-server transaction, said Eric Sall, director of product and application marketing for Notes.

Sall said Lotus will next release Quickstart — support information on Notes — on the new channel. The software is now in beta testing, he

said. He did not say when it would be available.

Last week, Lotus was working out a kink in the system. A few users had trouble with the Lotus requirement that they name their Notes server in a consistent fashion that would include the server name and company name.

"They asked us to append our company name into the server name," said Margaret Whack, a senior planning consultant at Metropolitan Life Insurance Co. "This could be a long and complicated process."

Sall said it is critical to have a consistent and secure approach to identify the participants in the Notes channel. "We don't want any risks of [customers] opening up their own networks to security problems," he said.

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Microsoft outsources European hub

BY ELISABETH HORWITT
CW STAFF

REDMOND, Wash. — Microsoft Corp. has joined the growing throng of major U.S. corporations that have turned over the burden of managing their overseas networks to a global carrier.

Under a five-year pact announced last week, BT, formerly British Telecommunications PLC, will house, maintain and manage Microsoft's major European hub in the UK, along with those circuits that radiate out from the hub to its offices across Europe, said Microsoft's director of corporate networks, Joseph Monteleone. The contract amount was not disclosed.

Microsoft is also on the verge of signing a similar contract under which AT&T will take over management of its Pacific Rim network, Monteleone said. And the software vendor is looking at the possibility of turning over maintenance of its four major

U.S. network nodes to one of the three interexchange carriers that it currently uses, he added.

Motivating all of the above moves is the software vendor's need for 24-hour-a-day, 7-day-a-week network reliability, coupled with a corporate limit on the hiring of new bodies, Monteleone said.

"It's just a lot easier to outsource than to hire," particularly in Europe, where "the market commands a higher salary than in the U.S." for talented network technicians, he added.

Monteleone said the BT deal saved him from hiring between 7 and 10 people to oversee the European network.

Not that Microsoft intends to turn over network control entirely to carriers. The company will continue to have eight telecommunications people in Europe and between two and six

people on shift at its network control center here. The control center will use Ungermann-Bass, Inc.'s NetDirector to monitor remote local-area network hubs, Monteleone said.

Microsoft has placed a high priority on ensuring reliable, nonstop operations for its European network, which handles approximately 3.5 million electronic-mail messages per month and serves 1,600 employees at 13 subsidiaries and 22 networked sites, the company said.

One unusual aspect of the Microsoft/BT contract is that BT has committed itself to providing end-to-end diagnostics of leased-line connections that radiate out of the UK — even though another Postal Telephone and Telegraph authority handles the other half of the link, Monteleone said.



Novell NetWare support still lacking

CONTINUED FROM PAGE 1

manager of network services at the M. D. Anderson Cancer Center in Houston, decided to become self-sufficient. "It was less Novell than the resellers," Kohner said, adding that plodding support forced the hospital to build its own service team two years ago. "We're the world's largest cancer treatment center. We can't [afford to] call someone and wait for an answer."

Novell needs to innovate with support the same way it has with software, said users, who were clearly not impressed with the

Novell community's support offerings to date.

Network administrators complained that direct support is expensive and can be slow. Indirect support can be shoddy and uncertain, resulting in hit-or-miss solutions.

Another problem, users said, is that there are just not enough qualified network experts to go around. "There are all these layers [of complexity with NetWare networks] that require a lot more [support] people," said Winston Leong, communications

consultant at Avon Products, Inc. in Pasadena, Calif.

Against this backdrop of complaints, Novell last spring spearheaded the Technical Support Alliance, which now comprises about three dozen firms including Intel Corp., IBM, Apple Computer, Inc. and Borland International, Inc. Allies pledged to take responsibility for problems brought to their doors, even if resolution led customers to another ally.

But these efforts have failed to convince many network managers that much has changed.

"We're not aware of [the alliance]," said Tracy Currie, senior network engineer at pharmaceuticals giant McKesson Corp. in San Francisco. "I guess that speaks volumes about it." Leaders of two large NetWare user groups said they could not point to a single member who has made use of the alliance.

Lacking the equipment

Dennis Bogart, senior network design engineer at Fluor Daniel, Inc. in Irvine, Calif., said he tried to get assistance through alliance member Ungermann-Bass, Inc. but found that it "didn't even have the latest version of NetWare installed at the office I called."

While the Technical Support Alliance, in particular, deviates from Novell's firm policy to encourage customers to find support through distributors, resellers and certified NetWare engineers, it appears that many users would just as soon have Novell back way off that policy.

"Dealing with resellers and

Smart hubs to pick up server functions

BY JOANIE M. WEXLER
CW STAFF

Users trying to integrate workgroup management and security into their enterprise networking schemes while freeing up overburdened file servers will soon be able to relocate server functions into smart wiring hubs.

Ungermann-Bass, Inc. and Network, Inc. — of which UB is a 50% owner — said last week they client teamed up with Novell, Inc. to migrate NetWare and its associated applications into their wiring centers in August.

Shifting the way distributed network services and applications are deployed and managed would integrate the administrative strengths of the traditional glasshouse with the desktop diversity achieved via client/server computing. With the hub and server running NetWare, management of the devices can be integrated so that one department — likely information systems — can relieve scattered units of their server management duties.

"This scheme will allow us to funnel all management through our network group," said Greg Parcell, project manager at the Chicago Board of Trade, a large UB shop keen on the concept.

Though some analysts said they anticipate turf battles between local-area network administrators and IS managers with the change, "in our situation, most of our departmental people will be happy to give that task up," Parcell said.

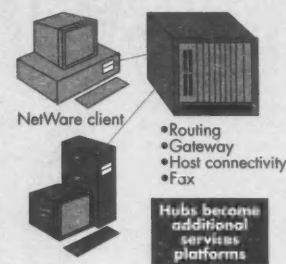
Duane Murray, vice president and general manager of Novell's Network Management Products Division, said that when Novell announced its Hub Management Interface specification for bundling low-end hub cards into its servers last Octo-

ber, "we only told you half the story. Now we're going the other way — to move NetWare into hubs for our large customers."

UB advocates moving communications-related services, such as routing and messaging, to the hub, although any NetWare Loadable Module (NLM) or other NetWare application could reside there, said Joe Hielscher, a UB strategic

NetWare packs its bags

Shifting NLMs onto a more powerful, NetWare-based hub platform consolidates management within the enterprise



planner. But Network President John McHale said he would expect file and print services to remain on NetWare servers while any combination of other applications shift into the more power-intensive hub.

Lee Roth, LAN systems manager at Southwest Airlines Co., a Network user based in Dallas, said that "for less than \$5,000, you're getting a router and something that can hold application NLMs. That's simply more bang for your buck."

Novell customer Johnson & Gibbs, P.C., a Dallas law firm, has created a whole new network design based on the NetWare-in-a-hub concept because of performance hits it is now taking with its external Novell bridge/routers, said Bruce Hatch, manager of network administration.

Customer satisfaction?

Despite user complaints, Chad Allred, Novell's director of services marketing, said Novell is doing the best it can in a growing network services market that it classifies as "a multibillion-dollar industry."

The company is also unapologetic about the expense, which can run from \$100-per-incident telephone charges to \$10,000 phone service contracts. "Only 2% of a network's cost is NetWare," Allred said. Novell cannot afford to pick up all or even most support costs, he said.

Even so, Novell's support budget has "almost doubled" in the last 18 months, claimed Allred, who would not cite specific figures.

Novell's services and support vice president, Richard King, claimed that average problem resolution times have fallen to 30 to 45 minutes. And, according to Allred, the company's internal customer-satisfaction rating for NetWare is approaching 4.0 — the highest score. Allred said the rating has increased from 3.42 in January 1991 to 3.85 in March.

Users interviewed recently countered those statistics with reports of inaccurate and delayed answers. For example, in trying to get help with her access server, Beverly Strother, a technical analyst at Southern California Gas Co., "waited on the line, and then got an answer I didn't need. The access server is not [Novell's] No. 1 money-maker. Now it's at a dead end."

JIM NASH

Infonet melds LAN, SNA traffic

BY ELISABETH HORWITT
CW STAFF

EL SEGUNDO, Calif. — Inspired by users seeking to move applications off the mainframe and onto local-area networks, Infont Services Corp. last week said it will soon carry IBM Systems Network Architecture (SNA) transmissions, along with several additional LAN protocols, between its customers' sites worldwide. However, the company said it is still evaluating which underlying technology to use in order to provide the services.

One service that Infont plans to begin offering by year's end will allow customers to integrate SNA and LAN interconnectivity over the same links, according to an Infont spokesman. The service will initially support IBM's Synchronous Data Link Control protocol, with support for IBM's Advanced Peer-to-Peer Networking protocols expected sometime in 1993, he said. Pricing was not disclosed.

Infont also announced new protocol support for its existing InfoLAN service, which interconnects customers over a virtual network by means of Cisco Systems, Inc. hubs. The additional protocols include Digital Equipment Corp.'s Phase IV, DECnet/Open Systems Interconnect (OSI) and regular OSI; Novell, Inc.'s IPX; and Apple Computer, Inc.'s AppleTalk Phase 1 and Phase 2. The service already supports Transmission Control Protocol/Internet Protocol (TCP/IP) and source route bridging protocols.

Infont also said it has added InfoLAN hubs in Australia, Denmark, Ireland, Italy, Japan, Spain and Singapore.

A recent survey of 100 European corporations by The Yankee Group's European division found that 30% of respondents expect a major move to LAN internetworking within the next five years.

No hassle

Corporations such as J. P. Morgan & Co. and most recently Microsoft Corp. have outsourced their LAN-to-LAN backbones to global carriers, primarily because they do not want the expense and trouble of implementing and managing their own private networks.

Mips Computer Systems, Inc. moved to Infont about 18 months ago to interconnect its TCP/IP LANs, said Victor Fischer, director of MIS at the Sunnyvale, Calif.-based supplier of reduced instruction set computing systems.

The company had been using Infont's X.25 service but discovered that protocol overhead was taking up as much as 75% of

the service's promised 9.6K bit/sec. bandwidth, Fischer said. As a result, it was taking hours to send a 2M-byte file, and interactive terminal-to-host sessions seemed jerky to users, he added.

Moving to Infont, which handles multiple customers'

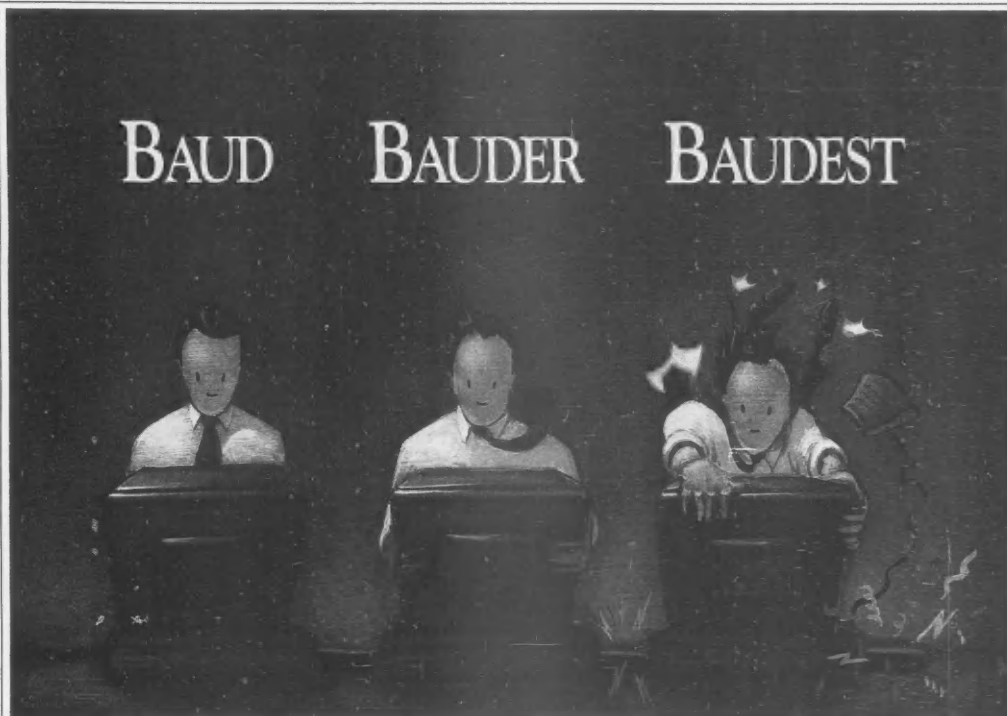
LAN transmissions over a shared Infont leased-line backbone, resulted in a threefold increase in effective throughput, Fischer said. Designing and running its own LAN internetwork would have required "a substantial expansion of [IS] personnel,"

according to Fischer.

Infont is far from the only company zeroing in on the international LAN internetworking market. Rival BT now provides a frame-relay service that supports both SNA and protocol-independent LAN-to-LAN communications, according to BT.

Indeed, Infont said it and other carriers are all trying to figure out the optimal underlying

technology for their LAN-to-LAN services, with some leaning toward frame relay and some toward Switched Multimegabit Data Service. Infont is evaluating frame relay-based LAN interconnection services but is concerned about the lack of standards that would ensure interconnection between multivendor customer premises equipment and frame-relay services.



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NEWS SHORTS

Bill may block RBOC plans

Rep. Jack Brooks (D-Texas) introduced a bill last week that would bar the regional Bell operating companies (RBOC) from providing information and long-distance services and manufacturing. The Bells expressed outrage, but newspaper publishers and AT&T were elated at the action, which would erase a 1991 court decision that said the RBOCs could proceed.

Iceberg to ship a quarter late

Storage Technology Corp. confirmed last week that it expects to begin production shipments of Iceberg, its advanced disk array subsystem in the fourth quarter due to delays in the completion and testing of its microcode. It will not "guarantee completion" in the revised time frame. Based on this schedule, the product is likely to garner "significantly less" than its 1992 revenue goal of \$50 million, the company said.

Citicorp picks MCI

The first major fruit of Citicorp's network consolidation program announced last fall [CW, Nov. 18, 1991] kicked in last week when the banking giant selected MCI Communications Corp. as the primary carrier for its domestic voice services. A Citicorp official estimated that the services package will save at least \$50 million in voice costs during the four-year duration of the \$250 million contract.

Focus gets query/analyzer

This week at the International DB2 Users Group Conference in New York, Information Builders, Inc. will introduce SmartMode for Focus, an intelligent query/analyzer designed to control requests from the company's fourth-generation language. SmartMode uses an embedded expert system engine to predict the resource utilization of Focus requests while estimating the cost of any data report request. It supports several databases and file structures on Unix, IBM's MVS and VM environments and Digital Equipment Corp.'s VAX/VMS systems. The product ranges in price from \$24,000 to \$39,600 and is slated to ship this quarter.

Short takes

Through June 30, DEC will ship free versions of **Lotus Development Corp.**'s \$795 SmartSuite set of applications with DEC's 386- and 486-based personal computers. . . . **Meta-pher, Inc.** cut prices on its Data Interpretation System, a client/server software package, which now ranges from \$825 to \$4,100 per user vs. \$5,000 previously; the LAN portion is still priced separately. . . . **Data General Corp.** cut prices 25% to 30% on certain low-end reduced instruction set computing-based Avion servers and workstations. The price of the AV 4300 entry-level server dropped from \$13,995 to \$9,995. . . . **Wang Laboratories, Inc.** unveiled the VS 12000, the first of 37 VS-related products due out this year. The VS 12000 sports 50% more processing power than the previous top-end VS 10000; the Model 550 is available now for \$780,000. The system ranges from \$429,350 to \$601,450 as a VS 10000 upgrade. . . . **IBM** is teaming up with two service sector firms — **Grubb & Ellis** and **Norrell Corp.** — to form two new alliances to provide facilities services and business support at select IBM and other customer sites. . . . **Borland International, Inc., Microsoft Corp.** and its recent acquisition, **Fox Software, Inc.**, have announced support for an Xbase language standard intended to increase compatibility across Xbase products and platforms. . . . **Netlink, Inc.** announced Ethernet support for its IBM Synchronous Data Link Control (SDLC) link server, which it claimed is the only server to support both Token Ring and Ethernet links to SDLC. . . . **Gates Energy Products, Inc.** will introduce its Hydritech line of rechargeable nickel-metal hydride batteries tomorrow. . . . **New York Life Insurance Co.** has approved **NEC Technologies, Inc.** notebook computers for use by its sales force. . . . **Systems & Computer Technology Corp.** agreed to pay **Dun & Bradstreet Software** \$22.5 million for D&B Software's school administration software unit, **Information Associates, Inc.**

Users urge protocol coalescence

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — Multiple communications protocols are likely to flourish on corporate networks for at least the remainder of the decade — a fact of life forming the major impetus behind the attendance of an expected 20,000 networking professionals at Interop '92 Spring here next week.

Given the hodgepodge nature of today's networks, it is not surprising that a *Computerworld* survey of more than 200 technical managers seeking network glue at the last Interop show, held in San Jose, Calif., revealed that compliance to communications standards was the key factor driving their networking strategies (see chart).

"We have a mixed [protocol] environment, so adherence to standards for interoperability is our most important consideration," said Robert Gulett, a network analyst at Allied Van Lines, Inc. in Naperville, Ill.

Protocol staying power at Allied is reflected in a rising use of Transmission Control Protocol/Internet Protocol (TCP/IP) and Novell, Inc.'s IPX. In addition, the firm intends to grow its IBM Systems Network Architecture (SNA) network by 25% during the next two years, Gulett said.

To help users cope, Interop '92 Spring focuses on vendors' gear that interoperates in enterprise networks via myriad technologies, allowing users to observe that "islands of automation have evolved into coalescing continents," said Dan Lynch,

president of show sponsor Interop, Inc.

Frame-relay and Fiber Distributed Data Interface (FDDI) demonstrations promise to be packed, as these technologies were pegged by *Computerworld* survey respondents as their primary methods of backbone local-area network inter-

term. This could chagrin many users who are further along in their evaluations of the more mature frame-relay technology.

In addition to wide-area backbone technologies, a strong emphasis in the show's tutorials and exhibits will be on "how SNA can play in an interoperability world," Lynch said. Inter-

Major issues affecting networking strategies

Percent of respondents citing issue as critical

Adherence to standards	86%
Reliability	77%
Security	72%
Multiprotocol routing	70%
Integrated network management offering	66%

Based on survey of 222 nonexhibiting attendees of Interop '91
Multiple responses allowed

Source: *Computerworld/Interop, Inc.*

CW Chart: Michael Siggins

connection during the next 18 months.

FDDI topped the charts with 44% of the respondents planning to deploy the technology, compared with 41% of users planning on frame relay, 21% looking into Switched Multimegabit Data Services (SMDS), and 18% planning on new X.25 deployments.

Bells chime in

At the show, the regional Bell operating companies plan to detail their rollout plans for these technologies, said Robyn Aber, a product manager at Bellcore.

However, she said, SMDS will be getting more attention than frame relay in the short

networking vendors such as Cisco Systems, Inc., 3Com Corp. and CrossCom Corp. will demonstrate recently announced features for handling IBM traffic.

On the LAN side, according to the survey, FDDI as a workgroup network is slated to be in use by 60% of the respondents 18 months from now. Token Ring networks at 4M and 16M bit/sec. speeds will be in use in 30% and 37% of the respondents' networks, respectively, during the same time period.

Not surprisingly, 96% of respondents will have TCP/IP installed in the next 18 months, but an unexpected 55% will have Open Systems Interconnect installed.

Non-Stop competition for System View

BY ELISABETH HORWITT
CW STAFF

RESTON, Va. — Systems Center, Inc. is expected to introduce a quiverful of network and system management products next week that it hopes will inflict some serious competitive damage on IBM's SystemView and NetView packages.

Systems Center and Tandem Computers, Inc. will jointly release Non-Stop Net/Master, which will enable users to manage both Tandem and IBM networks from a Tandem host, according to James Herman, principal consultant at Northeast Consulting Resources, Inc. in Boston. The vendors first announced that they were codeveloping the product approximately two years ago.

While many users will balk at managing their IBM installations from a Tandem machine, Tandem's Non-Stop architecture offers at least two advantages over

IBM hosts: fault tolerance and a lower entry price, Herman said. The hardware component of Non-Stop Net/Master starts at \$25,000, he added. The software ranges from about \$3,000 to \$100,000, depending on configuration, Herman said.

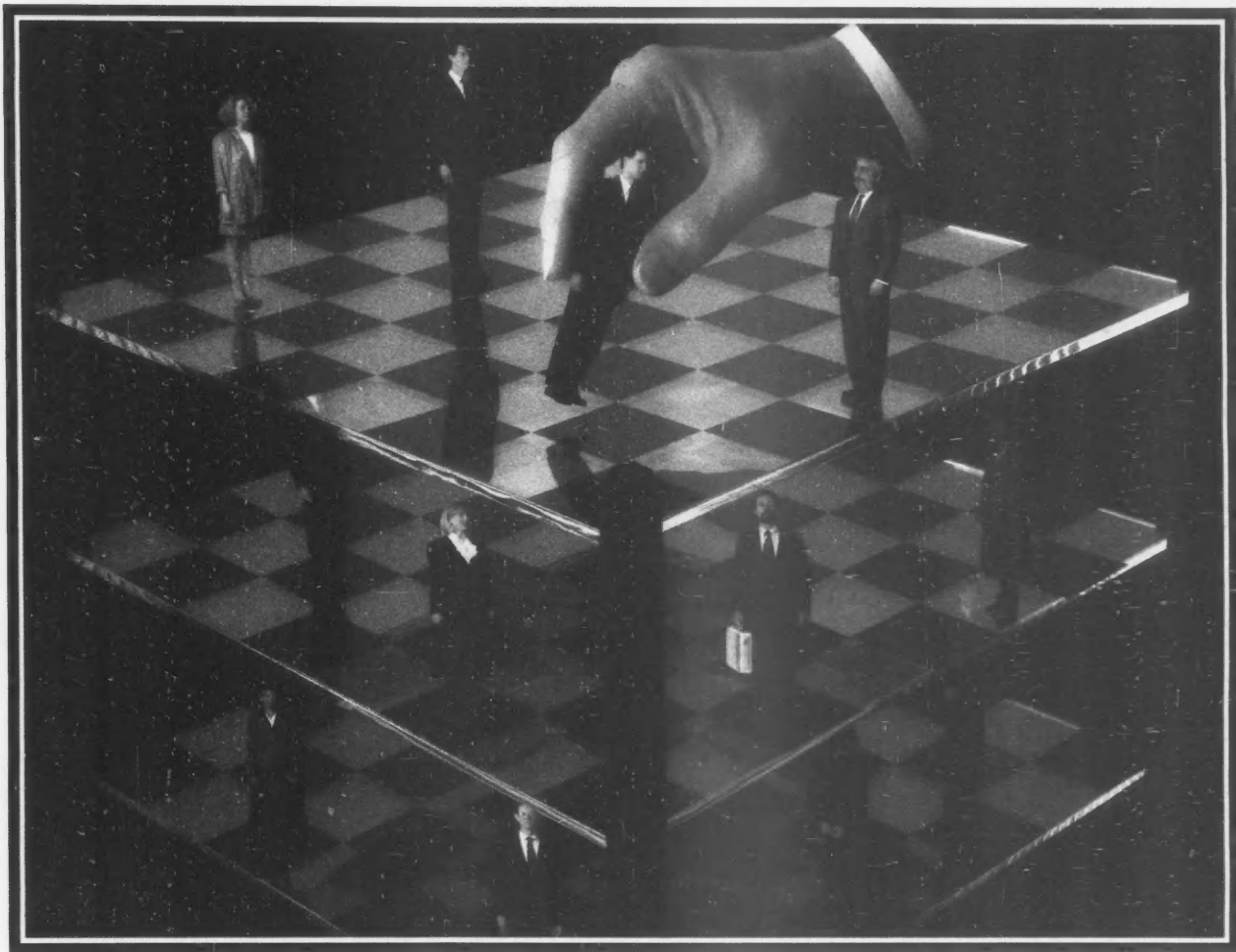
Better than before

Non-Stop Net/Master provides Tandem users with a more functional management system than Tandem's previous Distributed Systems Management product, analysts said. The new product is expected to provide more data center automation features than its predecessor. The initial release of Non-Stop Net/Master is scheduled to ship in late summer. Enhancements that are expected to be announced at a future date include support of the Simple Network Management Protocol and a graphical user interface. The initial product will support user access from an IBM 3270 terminal, Herman said.

Also next week, Systems Center will add several new modules to its Solve series of network and system management applications, according to David Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn. The new modules are expected to include the following:

- **Solve:Problem** is said to identify, locate and contain network problems.
- **Solve:Asset, Solve:Configuration and Solve:Change** are said to track and control deployment of resources and to manage moves, changes and reconfigurations on the network.
- **Solve:Connect** is said to build bridges between standards-based and proprietary networks and network management systems.
- **Solve:LAN**, a Microsoft Corp. OS/2-based local-area network management package announced by Systems Center last January, will be enhanced.

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TI (finally) delivers souped-up SPARC

BY MARK HALPER
CW STAFF

HOUSTON — Texas Instruments, Inc. trotted its long-awaited SuperSPARC microprocessor into the RISC ring last week. It implements a superscalar design that portends substantial system performance advantages but weighed in below expected heavyweight proportions.

Sun Microsystems, Inc., which designed the chip, has scheduled a product introduction for May 19, when it is widely believed that the company will unveil high-end workstations incorporating the

new reduced instruction set computing (RISC) device.

Larry Hambly, Sun's vice president of marketing, all but confirmed that the May 19 announcement will entail SuperSPARC-based products. "We plan on being a big customer of TI's for the chip for the coming months and years," he said.

SuperSPARC, which was code-named Viking, initially will not be available at the speeds that system vendors and users had anticipated, however. TI is offering 33-MHz and 40-MHz models and will introduce 45-MHz and 50-MHz editions by the end of this year, said Wally Rhines, execu-

tive vice president of TI's semiconductor group.

System performance ratings in Sun's forthcoming systems are therefore expected to be below the range that would have pushed Sun closer to rivals such as Hewlett-Packard Co. in raw performance. "It gets them closer to being competitive, but they still won't match the performance of other higher end products for single processors," said Michael Slater, editor and publisher of the "Microprocessor Report" in Sebastopol, Calif.

While the chip will not catapult Sun into the raw performance lead, it should

provide a price/performance advantage because SuperSPARC includes many features that have traditionally been furnished by other system circuitry, including logic for instruction sets, floating-point operations and MBus and XBus support.

"In absolute performance, HP will continue to be the leader well into 1993," said Robert Herwick, managing director of technical research at Hambrecht & Quist, Inc. in San Francisco. "But in terms of price/performance, this might give Sun the leadership position."

Superscalar superstar

The chip's performance is aided by its superscalar design, in which more than one instruction can be executed during each CPU cycle. Traditional CPU designs issue one or fewer instructions per cycle.

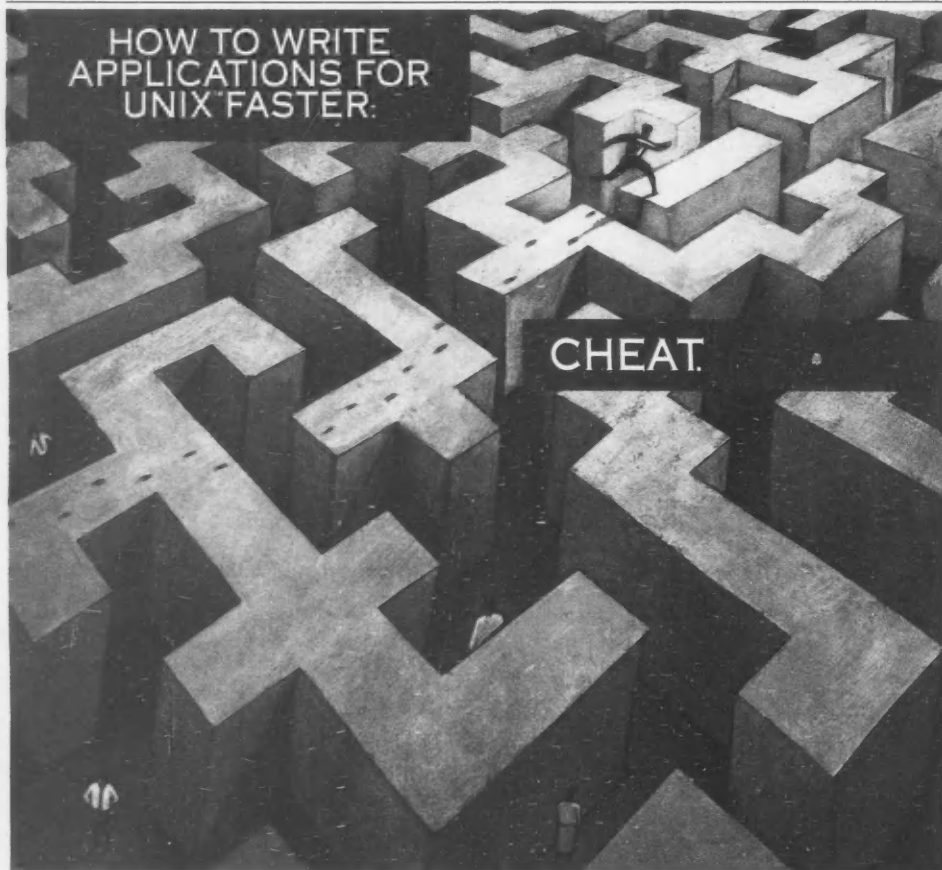
Rhines said that on the average, a system using the SuperSPARCs available today will execute 1.5 instructions per cycle, and system performance will improve two to three times over lower class Scalable Processor Architecture (SPARC) processors.

The chip's superscalar design will not be fully optimized, however, until software firms recompile their programs to tap the faster instruction capabilities.

TI is offering the chip to the highest ranking members of the SPARC International group and will make it available to other companies in the second half of this year, Rhines said.

The chip had been under development since 1988 and was expected months earlier.

Rhines attributed the delay to the complexity of the device, which includes 3.1 million transistors and functions typically handled by other board-level circuitry.



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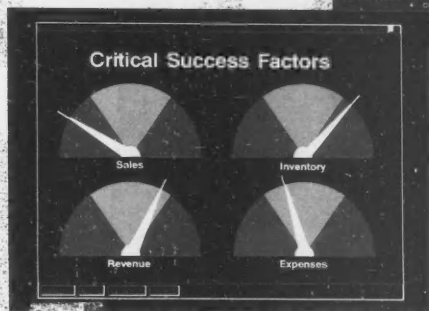
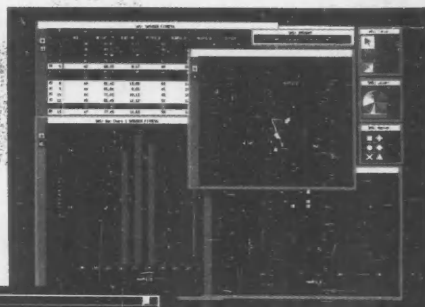
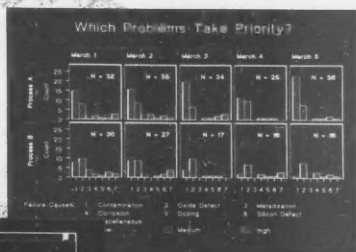
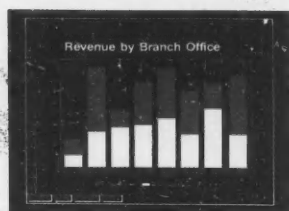
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DEC reveals FDDI switch

Amid the controversy about whether users will leapfrog Fiber Distributed Data Interface (FDDI) local-area networks for high-speed local switches to handle their emerging multimedia applications, Digital Equipment Corp. sanctioned the FDDI alternative last week with the demonstration and program announcement of a "personal FDDI" switch at its DECworld '92 show in Boston.

While DEC was mum on time frames or pricing, an analyst briefed on DEC's Gigaswitch said it was slated to roll out by year's end with a price tag of \$50,000 to \$100,000, depending on configuration. The switch will let each connected user communicate with the switch at FDDI's 100M bit/sec. speeds and through the switch at 3.6G bit/sec., DEC said. By dedicating FDDI's 100M bit/sec. bandwidth to each workstation connected to it, Gigaswitch builds on the concept of products from such vendors as Kalpana, Inc. and Synernetics, Inc., which dedicate the full 10M bit/sec. bandwidth of Ethernet LANs to individual users.

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NCR to migrate monitor to other Unix platforms

BY ELLIS BOOKER
CWI STAFF

DAYTON, Ohio — NCR Corp.'s Top End, a transaction monitor for on-line, Unix-based applications, will be ported to several non-NCR Unix platforms later this summer, the AT&T subsid-

iary announced last week.

The porting and distribution will be handled by Independence Technologies, Inc., a Fremont, Calif.-based Unix development and consulting firm.

Within eight weeks, Top End will be available on Hewlett-Packard Co.'s HP 9000 plat-

form, said Independence executives, who also plan to port the monitor to Sun Microsystems, Inc.'s SPARCserver, IBM's RISC System/6000 and Pyramid Technology Corp.'s MIServer by the third quarter.

Industry analysts welcomed the news, saying it should broad-

en the appeal of the year-old NCR monitor, which until now has been available exclusively for NCR's own System 3000 Unix hardware line.

It also shows how Unix vendors are "decoupling aspects of their software architectures and making them available on com-

peting platforms," said Dave Hudson, director at Standish Group International in Hyannis, Mass.

While the market for Unix-based on-line transaction processors (OLTP) was less than \$1 billion in 1991, Hudson said he expects impressive growth through the middle of the decade.

Commercial customers, according to Hudson and others, are coming to believe that Unix can handle transaction-intensive on-line applications — such as reservation systems — that were once considered the sole province of proprietary hardware and software.

In response, leading computer vendors — IBM included — will be marketing Unix-based OLTP by year's end.

Already in use

Commercially available since March, Top End has been deployed at some 20 user and software developer sites to date, according to NCR officials. The product is based on the distributed transaction processing model from X/Open Consortium Ltd. The software also uses X/Open's Resource Manager interface, XA, to communicate with XA-compliant relational databases.

Interestingly, the most widely deployed Unix OLTP monitor at the moment is Tuxedo, which was developed by NCR parent AT&T in the mid-1980s. Tuxedo is now owned and marketed by Unix System Laboratories, Inc. "There are 500 or so Tuxedo licenses out there," said Roy Schulte, program director of software management strategies at Gartner Group, Inc. in Stamford, Conn.

Nonetheless, Schulte said he thinks Top End will gather steam among large users because its design can support "thousands of terminals and hundreds of transactions per second," he said.

A third monitor from Pittsburgh-based Transarc Corp. began shipping this month. Called Encina, it uses the Open Software Foundation's Distributed Computing Environment standard.

Top End was designated as the strategic transaction monitor for the combined AT&T/NCR when the two companies detailed their converged product line in June 1991.

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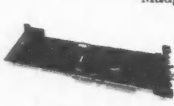
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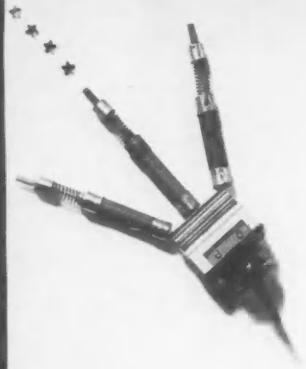
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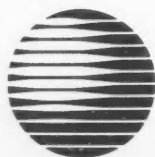
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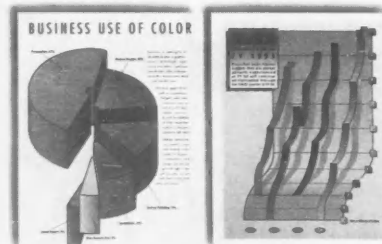
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Five years out

■ Look out if you want to know where multimedia technology can go. One recent study predicted that the market for business-oriented multimedia will grow 18 times, from \$500 million last year to \$9 billion in 1997. Ovum Ltd., a consulting firm based in London, sees multimedia growth as being tied to three key technology phases: customized systems, packaged multimedia software and advanced desktop communications. The report said that by 1997, multimedia personal computers will account for 34% of the installed base of business computers.

Five years back

■ Literature about the 1987 Chernobyl nuclear accident is going on-line. The Pacific Northwest Division of Battelle Memorial Institute in Richland, Wash., has released a personal computer software package called Chernolit. The program contains more than 4,500 cited references and abstracts relating to the tragedy. It now runs on IBM PCs and compatibles and will be offered for the Apple Computer, Inc. Macintosh in the future.

Learn by example

■ Bellcore researchers in Morristown, N.J., said they have developed a neural network computer that learns the way school children do — following simple examples provided by an electronic teacher. Bellcore researcher Josh Alspector said the experimental computer can learn and process patterns in more than 100,000 individual signals per second — 10 thousand times faster than is possible with a high-speed workstation. The computer can learn to add two numbers and then generalize that knowledge to solve other addition problems, he said. That capability, he added, could be at the core of computers that could solve complex problems faster than current neural network machines.

The battle of the batteries begins

Possibilities are 'infinite' in making longer lasting batteries for portable computers

BY MICHAEL FITZGERALD
CW STAFF

High-powered, dynamic, volatile, even explosive — yes, it's the world of battery research, and the future could well influence portable computing in ways beyond simply longer life.

Users are buying hundreds of thousands of portable computers, and industry observers said they expect continued brisk growth in the category during the next few years. Most battery-powered portables use 4 to 10 rechargeable nickel cadmium cells, which are available in the same AA through D sizes that designate alkaline batteries sold packaged together in retail stores, generally in a cylindrical case.

These cells generate power for two to three hours before they have to be recharged. While advances in power management have increased the amount of time a user can work in one session (some vendors claim up to eight hours between charges, depending on work habits), basic battery life has remained fairly stable, to the chagrin of users.

"We were told that the optimal notebook battery life is five to six hours," said Ralph Millard, manager of marketing at Gates Energy Products, Inc. in Gainesville, Fla. Gates, the largest North American manufacturer of rechargeable batteries, surveyed portable users on a number of factors, including usage.

Pull for power

To improve system life, computer vendors have begun to shift toward nickel metal hydride batteries. Nickel hydride batteries offer 30% longer life than NiCad batteries, and because they do not use the heavy metal cadmium, they do not present the environmental hazards that NiCads do. Standard alkaline cells provide power for smaller, subnotebook computers and personal organizers.

While battery makers said nickel hydride still has plenty of room for development and may eventually yield 50% longer life than NiCad batteries, the future may see a shift to one of several technologies that promise longer battery life from smaller packages than today's commercial products.

Most observers pointed to rechargeable lithium cells or possibly zinc air technology as the next standard-bearers for portable computer batteries. Direct methanol air could also serve for widespread commercial use.

Battery research resembles a dating service, in some ways. For starters, it

involves mixing two things together (researchers call these "couples") to create the optimal chemical reaction. A second way stems from the number of possible couples, which are "infinite," Millard said.

Lithium's leading edge

The most promising new technology appears to be rechargeable lithium.

"I think [rechargeable lithium] will be the savior — it's a good high-energy source and appears to be a safe system for commercial use," said Ralph J. Brodd, director of marketing at Valence Technology, Inc. in San Jose, Calif.



Janelle Genovese

Brodd's company is working on a type of rechargeable lithium battery known as a solid polymer system. The advantage of a solid polymer is its stability, he said, explaining that organic lithium combinations can leak, and if severely abused — for example, pierced by a bullet, a standard battery test — they can explode or catch fire.

The advantage of lithium is its energy density: A lithium battery provides four times the energy of a similarly sized NiCad one and offers the equivalent of at least four times longer battery life, before the vagaries of power management software are figured in.

Lithium cells already receive fairly common use — such as in cameras or memory backup in personal computers — but generally are in a form called primary batteries, which means they cannot be recharged and thus can only be used once.

Rechargeable lithium batteries have hit the market before, only to suffer various problems. Low "cycle life," or the number of times they can be drained and then recharged, remains an issue.

"They'll last only a couple of hundred cycles or so, which is not long enough to be of economic value for many applications," said Harvey Frank, a member of NASA's Jet Propulsion Laboratory's technical staff at the California Institute of Technology in Pasadena, Calif.

NiCad batteries last between 500 and 700 cycles, and nickel hydride between 300 and 500.

The jet lab's work focuses on lithium in its electrolyte form, rather than the less common solid polymer format being pushed at Valence. The lab's target is to develop high-level batteries that NASA can use for space missions.

Both Brodd and Frank said they think lithium could be priced well below NiCad cells in the future, though vendors like Gates Energy think this is less certain.

If rechargeable lithium can be stabilized, its energy density could allow for longer life in current systems and for significant redesign of portable systems, yielding reduced weight and possibly new features.

Millard said improved NiCad batteries have made color screens and 1486 chips possible in a battery-powered environment.

In order to prepare for the next generation of portables, Valence is aiming to bring prototypes of its rechargeable lithium battery to market in 18 months.

Frank and Brodd both said zinc air's energy density compares favorably with lithium, but the issue of cycle life also hampers zinc air.

This type of cell also does not handle large bursts of energy well, which is why zinc air batteries have tended to be used only in low-energy environments, such as hearing aids, although the portable environment rarely has significant power pulses.

It also draws power in part from oxygen in the air and hence cannot be totally enclosed.

But AER Energy Resources, Inc. in Atlanta plans to have a version of its new zinc air battery in the hands of systems vendors by year's end.

As for direct methanol, Frank said it offered an excellent source of energy. Methanol batteries refill fairly easily, but current versions do not produce enough energy for many purposes. They also contain platinum, which increases their expense.

Great expectations

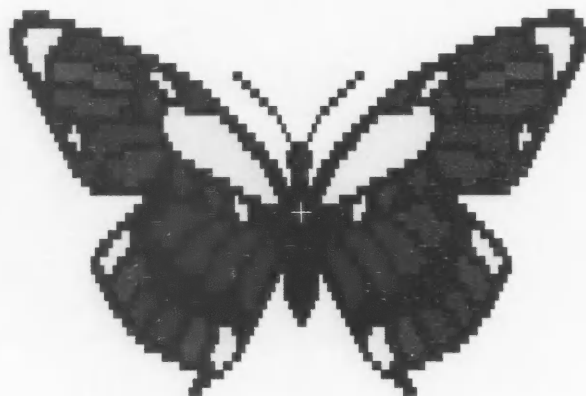
In the meantime, most observers said they expect nickel metal hydride to become far more popular as the other technologies develop.

"Five years from now, nickel metal hydride will be the dominant technology," said Robert O'Keefe, strategic markets manager at Duracell International, Inc.'s OEM Division in Bethel, Conn.

Nickel hydride is just beginning to become a factor in the market and will become much more widespread in the near future, he added.

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EDITORIAL

In-site insight

We've occasionally used this space to highlight new features in *Computerworld*. Today's issue marks the premier run of New Product In-Site, a monthly feature that will provide you with what we trust is valuable information for evaluating new technology.

New Product In-Site goes far beyond anything done previously to evaluate the technologies and products that vendors tout as their key offerings. We've chosen a methodology that draws upon the most unimpeachable and unbiased sources for those evaluations — namely, beta-test sites and early users.

We've incorporated these major sites into our Product Evaluation Council, which is described on page 89. This selection of users is critical to the success of evaluating complex technology, such as the ES/9000 we profile today.



Why? Because there are many complex products and technologies that simply cannot be tested or appraised in the confines of a test laboratory.

Anyone who understands corporate computing knows that every major user site is unique. The IS resource is directed at different corporate goals from company to company. The applications vary widely. Some firms use a technology to do significant batch processing, while others use the same technology to handle mostly complex on-line transactions. The installed base of equipment with which the new technology must coexist varies considerably from firm to firm. It's silly to think or claim that a laboratory can produce one-size-fits-all evaluations for most technologies beyond the desktop.

But the users — now there's a different test crew altogether. Our evaluation council has agreed to share real life experiences with you, in a frank and unbiased way.

In the coming months, we'll feature evaluations of breakthrough large systems storage technologies; of a major release of a network operating system; and of a major release of a long-awaited cross-platform database management system, the most widely used in the world.

We believe New Product In-Site will be a fitting companion for our twice-monthly Buyers' Scorecards, which offer user evaluations of products that have been in the marketplace beyond the beta-test and early-user stage.

Most importantly, we feel we are providing information you simply can't get anywhere else, information we have been told over and over that you want and need. If there are certain products or technologies that you are particularly interested in having evaluated, don't hesitate to call our research manager, Michael Sullivan-Trainor.

Bill Laberis

Bill Laberis, Editor in chief



LETTERS TO THE EDITOR

IBM challenges study on VAX, AS/400

We challenge the assumptions and methodology used by Technology Investment Strategies Corp. (TISC) in a study that was the basis of your article, "VAX line wins cost study battle against AS/400s" [CW, April 27]. We strongly believe the results are flawed and improperly represent the competitiveness of the IBM AS/400.

TISC selected larger AS/400 models to compare to DEC VAXs than customers would actually install to meet their application requirements. Also, TISC altered Transaction Processing Council (TPC) configurations and in many cases used estimated TPC-A performance ratings — contrary to the

TPC's intention — to reach the conclusions you reported.

The article does not mention two noteworthy footnotes in the study that invalidate TISC's cost-of-ownership results:

- The AS/400 system software, OS/400, contains many integrated features that VAX users have to purchase separately.

- The software license configuration and associated costs used by DEC in the TPC-A benchmark are potentially understated for many actual customer installations.

Fred J. Wiele
AS/400 systems
management
IBM
White Plains, N.Y.

Frame relay: Expect what you pay for

In response to your article "Firm discards public frame-relay network," [CW, April 6], I feel compelled to comment on Industrial Design Corp.'s expectations of frame-relay service.

The major benefit of frame relay is not its "highly touted bursting capability." In fact, the bursty nature of user applications is one of the factors that the frame-relay service provider and user must control and accommodate for.

Throughout ANSI recommendations, there are repeated comments that user failure to live within committed information rates may result in discarded packets. Frame-relay service suppliers will attempt to deliver data in excess of committed information rates, but this is on a

best-effort basis.

Expecting the network to deliver more throughput than the user commits to during bursts on a consistent basis is wrong, and behaving this way only complicates matters for other users.

The major benefit of frame relay is its ability to support multiple, simultaneous virtual circuits at increased speeds as compared to traditional packet-mode services such as X.25. Frame relay provides a viable means to provide acceptable throughput/performance while reducing dedicated port and line costs. Expecting more than what you pay for is unrealistic and, in a public environment, not always fair.

John Agosta
American Institute
New York, N.Y.

Wang is a winner

Your recent series of negative articles focusing on Wang Laboratories compels me to offer my opinion, which is based on years of workplace experience with Wang equipment and service.

Wang Laboratories has offered solid value to my company, Fleishman-Hillard, Inc. Wang has been a big factor in our continuing growth — which has averaged 18% annually for the last five years — by keeping costs down while furnishing a user-friendly technology base for some of the most significant computer applications in the public relations industry.

For example, we have had customized billing for quite some time, and, as far as we know, we are industry pioneers in direct electronic time sheet entry. We also have one of the most advanced time-tracking systems in the industry. Moreover, with Wang's integrated electronic mail and 4GL application-generating relational database, we are building sophisticated systems that significantly reduce paper and increase productivity.

Your bias against Wang is evident in the lack of balance in your reporting. Most owners of Wang equipment know better.

Stephen C. Jung
St. Louis

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.



White Paper

OBJECT TECHNOLOGY:
A KEY SOFTWARE TECHNOLOGY
FOR THE '90s

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ADVANCED COMPUTING ENVIRONMENT

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DIGITAL. THE OPEN ADVANTAGE.

Introduction

Object technology is revolutionizing the face of computing. In terms of productivity and cost-effectiveness, its potential is staggering. At least one early implementation performed under favorable conditions resulted in a 14:1 ratio of productivity improvement.

As the emphasis changes from hardware to software, object technology — including object-oriented programming, object-oriented analysis and design, object-oriented database management systems and object-oriented application interoperability frameworks — is coming to the fore.

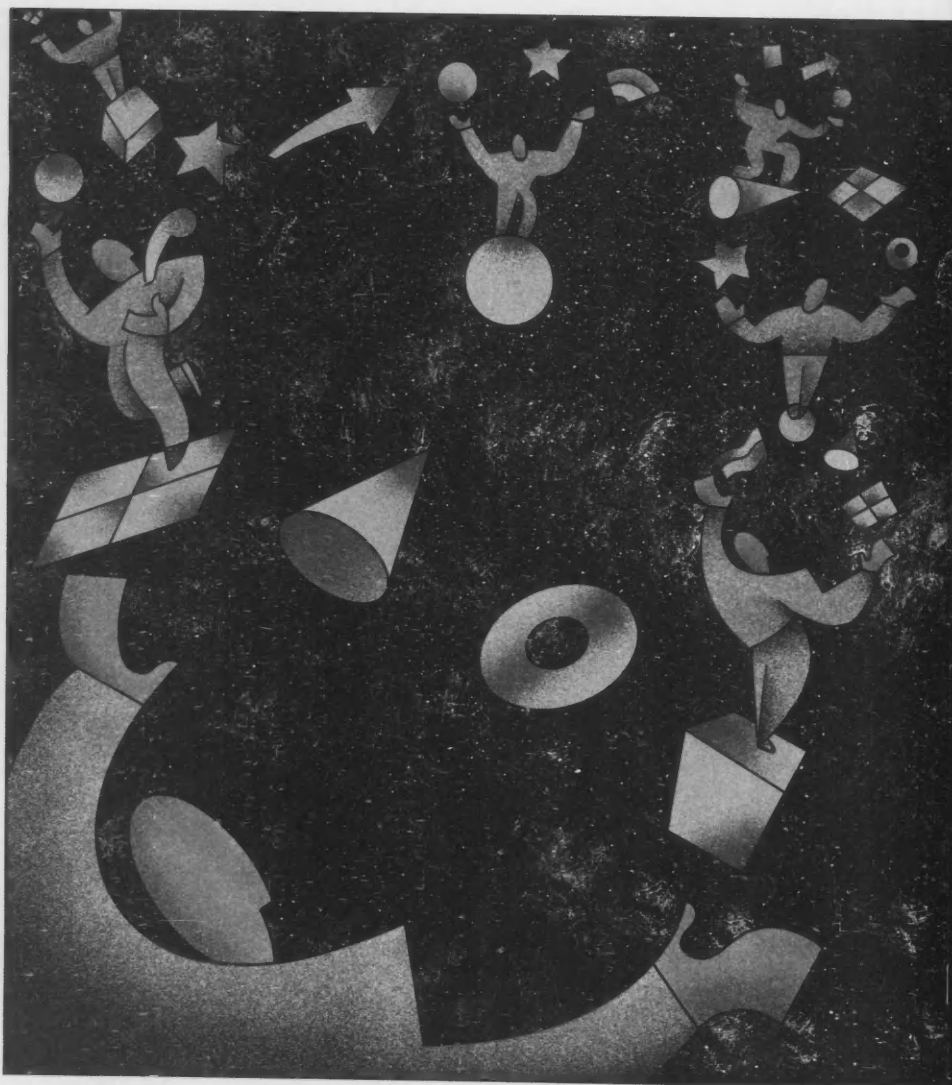
This trend is manifesting itself as a rapidly growing demand for object-oriented training and consulting. The demand is so strong that some training firms are actually doubling or even tripling their staffs to keep up. A recent spending survey conducted by IDC reveals that almost half of 1,600 respondents are becoming involved with object-oriented technology despite the cost of implementing it.

The reuse of standard software building blocks is integral to object technology. Just as hardware is assembled from pretested components, which are used repetitively to design and construct even larger assemblies, software too can now rely on pre-existing code through the use of object technology. For example, there are object-oriented programming languages with special libraries of reusable components especially for graphical user interfaces.

The primary benefits of object-oriented programming are improved reliability and enhanced programmer productivity. Other benefits include clarity and the opportunity to model applications in a more natural way. The hierarchical structure of object-oriented programming makes programs easier to design and understand.

Object technology is a powerful driving force behind the creation of less expensive, more productive software. Its place in the computing firmament is well-established and growing rapidly.

This White Paper was written independently of the *Computerworld* editorial department by Steve McClure, Senior Consultant, New Software Technologies, at International Data Corporation. For more information on the content of this White Paper, or for information on International Data Corporation, please call 508-872-8200. For more information on the White Paper Program, please call 508-879-0700.





THIS IDC WHITE PAPER IS ABOUT A SOFTWARE METHODOLOGY THAT IS STEADILY MOVING INTO THE MAINSTREAM. IDC BELIEVES IT WILL BE ONE OF THE MOST FUNDAMENTAL SOFTWARE TECHNOLOGIES OF THE 1990s. THE SUBJECT IS OBJECT TECHNOLOGY, A TERM THAT ENCOMPASSES SUCH THINGS AS OBJECT-ORIENTED PROGRAMMING, OBJECT-ORIENTED DATABASE MANAGEMENT SYS-

OBJECT TECHNOLOGY: A KEY SOFTWARE TECHNOLOGY FOR THE '90s

TEMS AND OBJECT-ORIENTED ANALYSIS AND DESIGN.

■ MICROPROCESSORS AND THEIR UNDERLYING INTEGRATED CIRCUIT TECHNOLOGIES CREATED A REVOLUTION OF EPIC PROPORTIONS IN THE INFORMATION PROCESSING INDUSTRY DURING THE 1980s. THE ABILITY TO PRODUCE LOW COST,

HIGHLY RELIABLE HARDWARE, REPETITIVELY AND EFFICIENTLY, FUELED THE DRAMATIC RISE OF PERSONAL COMPUTERS AND WORKSTATIONS. THE PRODUCTION OF SOFTWARE, MEANWHILE, HAS NOT KEPT PACE. ■ THE DEVELOPMENT OF SOFTWARE APPLICATIONS, IN TERMS OF COST AND QUALITY, HAS IMPROVED AT A BARELY DISCERN-

ible rate. This is changing. Hardware costs are a rapidly declining part of the overall cost of providing business solutions. Attention is now focused on programming, application development and maintenance. Ways are being sought to position software technology so that application solutions can be produced more rapidly, at less cost and with higher quality. The technology with the greatest promise of achieving this is object-oriented programming (OOP) and related disciplines. This promise exists because object technology supports the reuse of standard software building blocks.

It is appropriate to compare OOP with hardware development. Hardware is assembled from pretested components, which are used repetitively to design and construct even larger assemblies, themselves reusable. The quality of each level of design is insured by pretesting. The error-free assembly is insured by interface standards that focus on the behavior/functionality of each component at its interface.

These same concepts are being extended to software and application development through the use of object technology. Tools are beginning to appear that support object-oriented design and analysis. There are OOP languages, with special libraries of reusable components, especially for graphical user interfaces. And there are object-oriented database systems. All of them are intended to deliver the promise of object technology.

DRAMATIC SUCCESSES

Any IS professional who has been on the job for more than six months is skeptical of anyone suggesting that large potential benefits will accrue simply by embracing a new technology. Wasn't that what Computer-Aided Software Engineering (CASE) products were supposed to do? And why should we accept the counter-intuitive idea that software is analogous to hardware? Some organizations have begun collecting metrics while evaluating new software technology. Electronic Data Systems Corp. (EDS) has

done this for object-oriented programming.

EDS performed a carefully structured study of OOP using Smalltalk and an object-oriented database management system to replicate an existing manufacturing application. The application, a maintenance management system, had recently been implemented using PL/1 and a relational database. The system engineers from that project were still available and had kept sufficient records to allow a comparison. They also acted as the "user surrogate" for the Smalltalk team, which was brought in from the outside.

EDS took great pains to keep the skill level of the two teams comparable. The Smalltalk team worked from the same 300-page functional specification used by the original PL/1 team. The study measured the implementation effort from design through test. The original test plans and test suites were used to insure that all functions were implemented. This was a study, so the resulting system was never deployed. However, there were dramatic results; a 14:1 increase in design and programming productivity was shown.

It is important to realize two things about these gains. First, there was no object-technology learning curve. The Smalltalk team was experienced. Second, the functional specification used had been derived using traditional decompo-

sition techniques, not object-oriented analysis and design. Even in this carefully controlled context, these numbers seem too good to be true. They seem outrageous.

The natural inclination is to assume that despite EDS's efforts, something biased the outcome. That is not the case. Instead, we are witnessing the result of a paradigm shift. A paradigm is a way of viewing the world. Alan Kay, the developer of Smalltalk, is fond of saying that the ability to change one's point of view (paradigm) is worth 35 IQ points. An example would be learning to multiply Arabic numbers instead of Roman numerals. Proponents see OOP as a paradigm shift with similar benefits.

OBJECT TECHNOLOGY INTEREST RISING

In the past 16 months, the demand for training and consulting for object-oriented analysis and design has gone from healthy to explosive. Training firms are scrambling to double or triple the size of their staffs in order to keep up with the demand. This rapid rise in interest in object technology is also reflected in recent IDC spending surveys. In its most recent survey, IDC finds that almost half of the 1,600 respondents are becoming involved with object technology. Users were asked to characterize their use of object-oriented databases and languages in the next 12 months.

Overall, 26.8% describe their site's use of object-oriented databases or languages as exploratory, and 21% as significant. The highest projected use is at sites whose senior systems are IBM machines. There, 42% say their use is exploratory and 18% say it is significant. While this question is limited to languages and databases, it does reflect the rising level of interest that will also drive the related markets for tools, training and consulting.

BIG PROJECTS, BIG SAVINGS

NobelTech Systems AB, formerly Philips Elektronikindustri AB of Sweden, is a leading developer of command and control systems for the Swedish defense services. The company

SMALLTALK: 14:1 DESIGN AND PROGRAMMING PRODUCTIVITY GAINS		
Measure	Original implementation	Smalltalk implementation
Development time	19 months	3.5 months
Person-months	152	10.4
Lines of code	265,000 lines of PL/1	22,000 lines of Smalltalk

When Electronic Data Systems conducted a study of object-oriented programming using Smalltalk and an object-oriented database management system to replicate an existing manufacturing application, it realized an increase of 14:1 in productivity.

Due to a lack of photographic contrast, this page did not reproduce well.



THE LAST REVOLUTION WAS FOR PEOPLE WHO USE SOFTWARE. THIS ONE IS FOR THE PEOPLE WHO WRITE IT.

The graphical revolution made computers far easier to use, but infinitely more difficult to program. That's why the industry is so intent on object-oriented systems, where powerful applications are created in a fraction of the time.

For most companies, just the first effort is still at least three years away. But NeXT has a proven system that works today.

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interapplication communication—all with standard dialogs.

With the Interface Builder, you can use the mouse not only to place and resize your objects, but to change their attributes and define interaction—all without writing code.

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update, you need only modify a single object.

With NeXT workstations, custom software is both intuitive and consistent, offering stunning graphics and access to all system services.

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VISIT BOOTH #903 AT SUNWORLD EXPO '92

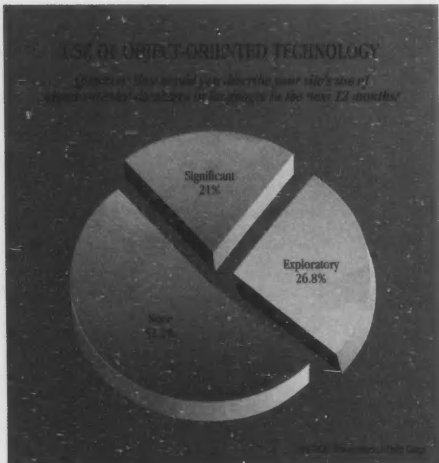
also develops real-time systems for several international markets. Its FS 2000 software system is an embedded shipboard command, control and communications application.

It supports a wide range of naval platforms and is being implemented on five ships from five countries. The electronics systems must be on a par with the complexity of those on much larger ships while enabling a small crew to control the operations. The varied requirements of the individual ships call for a well-engineered, flexible software design and architecture. For some projects, the ships must also be multi-configurable depending on operational needs, thus requiring the software to be highly adaptable. The complete FS 2000 system contains approximately 1.5 million lines of code for each ship. The software for each system comprises 150-600 programs. All this software creates an ideal environment for implementing object technology.

The OOD Approach

Early in development, NobelTech took an object-oriented design (OOD) approach to the architecture of the FS 2000 system. Later the firm used object-based programming to implement it. The implementation language chosen in 1986 was Ada. NobelTech selected an OOD approach because OOD enabled the design team to model the overall shipboard system more accurately and to ensure an optimal level of modularity and flexibility. OOD also supported NobelTech's long-term strategy of developing common, reusable software subsystems for future applications.

Working with a team of consultants from Rational Consultants of Santa Clara, Calif., the company developed a methodology that focused on the prototyping of software designs and an incremental integration of software subsystems. This focus enabled the development team to emphasize system-level design considerations and to detect architectural flaws early in the development process. Its approach also promoted a rapid maturation of critical interfaces throughout the software system.



The first ship system has been delivered, with systems two through five in development. Software productivity on the first system was more than twice that of NobelTech's historical average.

More importantly, NobelTech's subsequent questions show that productivity should improve by more than 600% for the remaining shipboard installations. Most of this improvement results from the high degree of software reuse attained, nearly 70%.

Historically, NobelTech had consumed about 40% of its development in the integration phase of projects. By using OOD, and increasing its efforts in the design phase, NobelTech reduced the time required for integration by more than half. This reduction in integration time translates directly into additional cost savings and quality improvement, because of the lower cost and reduced impact of finding and fixing errors earlier in the development process.

In attributing the cost savings for this project, NobelTech considered reuse, OOD and Rational products. Assuming reasonably that up to half of the reuse gains come from OOD/OOP (the other half coming from good architecture and good programming), the use of OOD/OOP has the potential to save this project between \$39.9 million and \$77.8 million during its seven-year life.

BENEFITS OF OBJECT-ORIENTED PROGRAMMING

The primary benefits of object-oriented programming are improved reliability and enhanced programmer productivity. Reliability is improved because each object is a "black box" to the external agents with which it communicates. The internal data structures and methods can be refined without impacting other sections of code. Traditional programs, in contrast, sometimes exhibit unanticipated side effects when a remote section of code is changed. The environments in which software must run have become exceedingly complex. There are graphical user interfaces, dynamic data interchanges

and remote database accesses. OOP is a way for programmers to cope with this complexity.

Programmer productivity is enhanced because classes of objects are reusable, i.e., each subclass or instance of an object can use the program code (methods) for the class. Programmer productivity is also enhanced by the more natural correspondence of program objects to the objects in the domain of the business application under development. Once the paradigm has been learned, application development is shortened, application developers can bring their products to market sooner and IS professionals can respond more quickly to user demands.

Other benefits are clarity and the opportunity to model applications in a more natural way. Because data and programs are stored together, object-oriented programs are easier to understand. The hierarchical structure of object-oriented programming is a natural way to represent many objects in the real world because successive layers present increasing levels of detail. This makes programs easier to design. It also makes programs easier to understand, a bonus for persons who must later maintain them.

ISSUES TO PLAN FOR

The major shortcoming of OOP is purported to be performance relative to tra-

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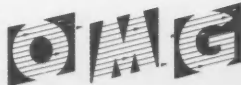
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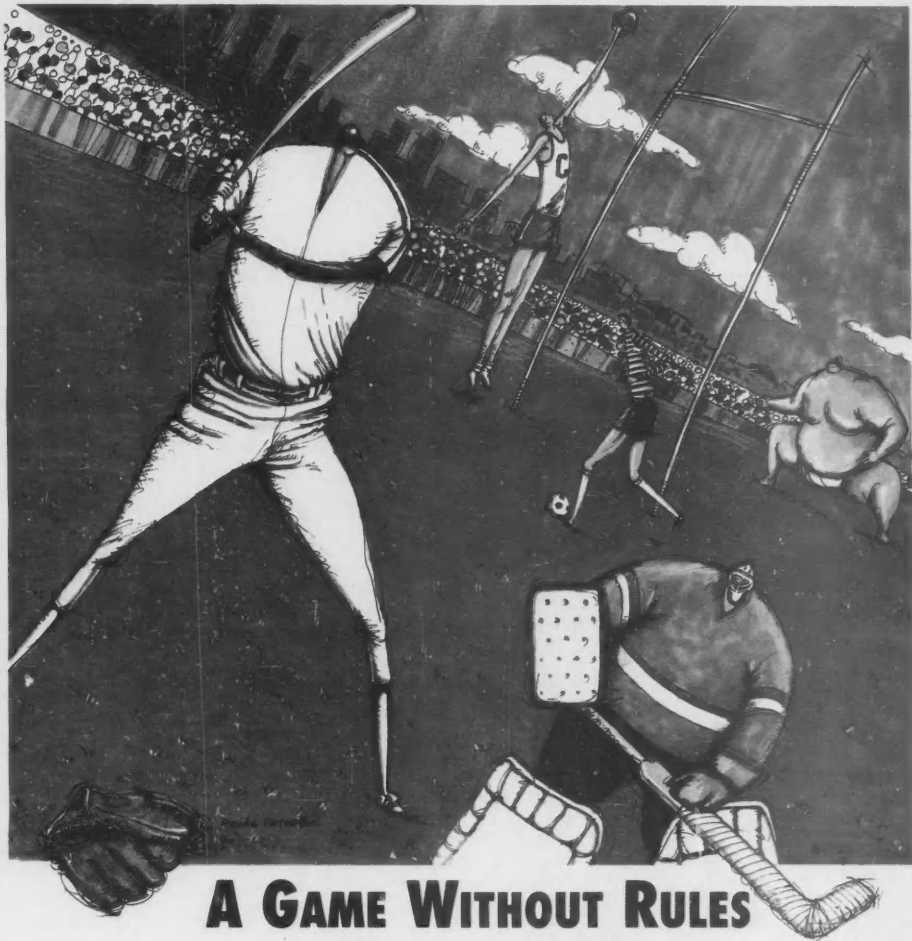
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OBJECT MANAGEMENT GROUP

Key Concepts of Object-Oriented Programming

The way to tackle the design of a skyscraper is to break it down floor by floor and subsystem by subsystem. Decomposition is nothing new. It is the basis for structured design methodologies that have been taught for over a decade. In object-oriented analysis and design, the primary emphasis is on classes and objects, in contrast to structured analysis and design, where the primary emphasis is on process-oriented functional decomposition. In object-oriented analysis, the emphasis is on data.

It is easier to model various aspects of any domain under study if we isolate essential details and discard less useful details. This natural inclination is called abstraction. When we think about a car, we don't think about every last detail that describes the car. Rather, we probably envision the major physical features (body, wheels) and a few of the major subsystems of the car like the drive train, steering and braking systems. Similarly, it is easier to control behavior if it is combined with the data structures to which it most often relates.

Object-oriented program development employs a bottom-up approach. Its basic premise is that during the life of an application, data structures remain relatively stable while the operations on those data structures change depending on particular situations. Thus the procedure is to first identify data structures that write small programs (procedures) for the operations on each data structure, and combine those into the objects that encapsulate the data structures with the procedures.

Finally, developers combine the objects into working programs in which work is accomplished by objects passing messages to each other. An object is activated by receiving a message specifying a behavior, and parameters to describe the behavior. After an object executes the behavior, it sends a message to another object.

This approach is the antithesis of structured programming popularized during the last two decades. Large numbers of programmers and analysts have been training in structured programming.

The key concepts of OOP are:

Objects — The basic building block of a program is an object. Objects are software entities. They may model something physical like a person, or they may model something virtual like a checking account. Normally an object has one or more attributes (fields) that collectively define the state of the object; behavior defined by a set of methods (procedures) that can modify those attributes; and an identity that

distinguishes it from all other objects. Some objects may be transient, existing temporarily during the execution of a program, i.e., only during run time. Others may be persistent, existing on some form of permanent storage (file, database, programming library) after the program finishes.

Encapsulation — This concept refers to the hiding of most of the details of the object. Both the attributes (data structure) and the methods (procedures) are hidden. Associated with the object is a set of operations that it can perform. These are not hidden. They constitute a well-defined interface — that aspect of the object that is externally visible. The point of encapsulation is to isolate the internal workings of the object so that, if they must be modified, those changes will also be isolated and not affect any part of the program.

Messaging — One object requests another object to perform its operations through messaging. The client object

sends a message to the server object consisting of the identity of the server object, the name of the operation and, in some cases, optional parameters. The names of the operations are limited to those defined for that object. For example, the operations for a checking account object may be defined to be OPEN, DEBIT, CREDIT, COMPUTE INTEREST, ISSUE STATEMENT, SCHEDULE AUDIT AND CLOSE.

Data Abstraction — An object is sometimes referred to as an instance of an abstract data type or class. Abstract data types are

constructed using the built-in data types supported by the underlying programming language, such as integer and date. The common characteristics (both attributes and methods) of a group of similar objects are collected to create a new data type or class. Not only is this a natural way to think about the problem domain, it is a very efficient way to write programs. Instead of individually describing several dozen instances, the programmer describes the class once. Once identified, each instance is complete with the exception of its instance variables. The instance variables are associated with each instance, i.e., each object; methods exist only with the classes.

Inheritance — Data abstraction can be carried up several levels. Classes can have superclasses and subclasses. In moving to a level of greater specificity, the application developer has the option to retain some attributes and methods of the superclass, while dropping or adding new attributes or methods. This allows greater flexibility in class definition. It is even possible in some languages to inherit from more than one parent. This is referred to as multiple inheritance.

"In object-oriented analysis and design, the primary emphasis is on classes and objects, in contrast to structured analysis and design, where the primary emphasis is on process-oriented functional decomposition. In object-oriented analysis, the emphasis is on data."

Object Technology: A Key Software Technology for the '90s

ditional third-generation languages. Similar concerns are expressed when comparing the performance of object-oriented database management systems (ODBMS) with specialized file systems. In the EDS example mentioned above, a response-time test showed that the Smalltalk implementation was twice as slow (30 vs. 15 seconds), as the existing application. Performance is degraded by the dynamic binding of methods to the data structures at run time.

Some object-oriented languages, e.g., C++, do support object compilation, which improves performance at the expense of flexibility and ease of maintenance. The database concerns are analogous to those in the early years of relational databases when hierarchical databases were known to perform better. The performance of ODBMS has improved markedly in the past two years, and will continue to improve.

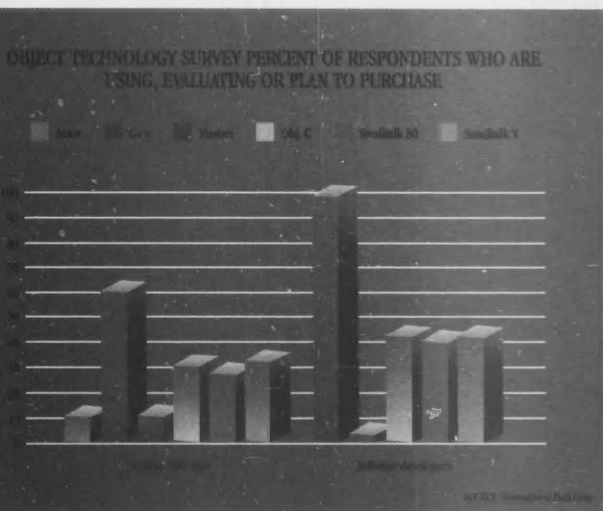
Productivity gains from program modularity and reusability can be difficult to achieve. Programmers, faced with a large complex system, can be challenged to find the appropriate objects and to select the proper method or to identify the optimum method. Smalltalk, for example, includes 5,000 methods in its programming environment. Tools are needed to help programmers make these choices. There is also a steep learning curve for traditional programmers. The lack of any standard object-oriented development methodology is also a problem.

MULTIPLE FORMS OF OBJECT TECHNOLOGY

Object technology is not just OOP. There are several areas where object technology is making its presence felt. The major ones are:

- Object-oriented analysis and design (OOAD)
- Object-oriented programming and development environments
- Object-oriented database management systems
- Object-based application interoperability frameworks.

There are many who feel that object-



oriented programming is going to displace structured analysis and design. Some feel it will negate the need for analysis and design altogether because developers will prototype their applications, drawing upon a rich set of class libraries. Unfortunately, both views are misguided.

The point of analysis and design, whether structured or object-oriented, is to deal with complexity by applying principles like decomposition and abstraction in a methodical way. There are elements of the traditional structured methods, such as entity-relationship diagrams and data flow diagrams, that can contribute to object-oriented analysis and design.

Many methodologists agree that there are three basic aspects of a software design: data, process and control. Data is the information content of the system, what is being processed and stored. Process is the algorithms, rules and operations performed on the data. Control is the determination of when or under what conditions the processes are performed.

In object-oriented analysis the emphasis is on data. Sally Shlaer and Stephen Mellor have summarized the different orientations.

Four major methodologies for OOAD include:

- Shlaer and Mellor: Object-Oriented Analysis, Object-Oriented Design Language, Recursive Design
- Coad and Yourdon: Object-Oriented Analysis
- Rambaugh, et. al. (GE): Object Modeling Techniques
- Booch: Object-Oriented Design.

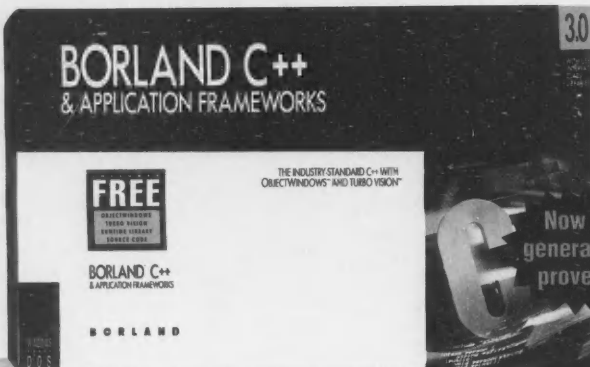
These are worth serious consideration because their proponents have written books that explain the methodology, and there is consulting and training available from the authors or from third parties. An additional reason is that there is at least one CASE tool available to support each methodology. There are also other significant methodologies. Objectory from Objective Systems of Sweden supports Jacobson's methodology. Interactive Development Environments of San Francisco is promoting an object-oriented, structured design methodology developed by its president, Tony Wasserman.

Similarly, Paradigm Plus from Houston-based Protosoft supports the Lekkos methodology. We will see this area continue to evolve, especially as some of the more traditional CASE companies like KnowledgeWare shift into this part of the market. James Martin is known to be working on business-oriented approaches to object-oriented development.

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B O R L A N D

CASE TOOLS SUPPORTING OOAD

Tools that support OOAD are part of the larger set of tools referred to as "upper CASE" tools. All upper CASE tools provide support for diagramming in one or more methodologies. This means they allow an analyst or designer to draw the diagrams and enter the descriptions according to the definition of the method.

This is not enough, so beware of these tools. The tools must also implement the various rules and evaluation criteria to perform design checking and insure the method is being properly followed. Further, the tool should allow the designer to naturally follow the step-by-step process of the method. Most of these tools have some sort of repository associated with them. Only a few were developed

specifically to be optimized for OOAD. Their repositories are structured with the idea of storing the object-oriented design in a canonical form appropriate to the paradigm.

When this is the case, the tool can often support more than one OOAD method, storing the essence and details of the design in its repository and displaying it more than one way. A tool with this capability generally lends itself to customization. Another important aspect of the tools is whether (and how) another tool vendor can interface its tool, e.g., a project management package, to the repository.

THE MARKET FOR OOAD TOOLS

The market for OOAD tools is small

when compared with the overall market for CASE tools. IDC believes that the OOAD tool market will remain relatively small, but will grow at a faster rate until 1996 when it will assume a growth rate similar to the overall CASE market.

Unix workstations are and will be the dominant platform in this market. While Ada has played a role in this market, it is diminishing quickly as C++ takes over. Both tool and training vendors report that C++ is the language of choice for more than 90% of their clients.

Several of the tool vendors are seeking alliances with either workstation vendors or very large consulting companies. This is a common strategy designed to circumvent the problems that small companies often have when they try to support client bases that are scattered over wide geographical areas. One Swedish vendor, Objective Systems, can be expected to enter the U.S. market in 1992 using this strategy.

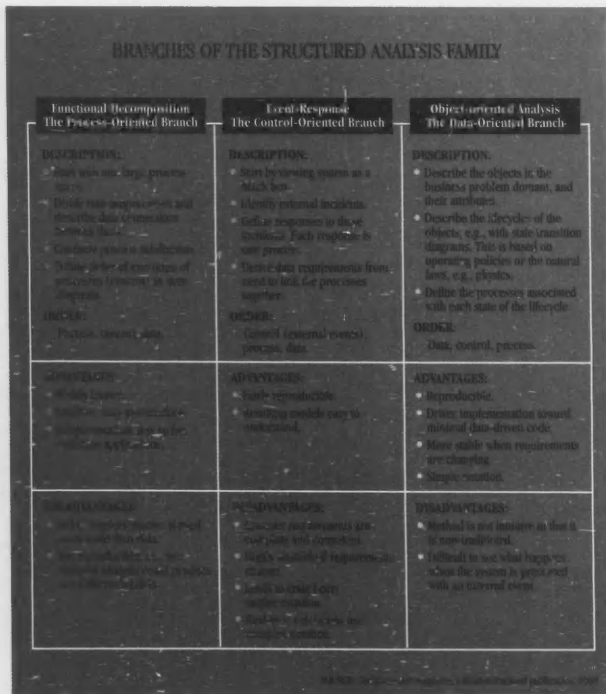
OOP LANGUAGES

There are more than 80 object-oriented languages. Of these, less than a quarter are commercial products; the rest are research vehicles or associated with university projects. All 80 are based on one of four categories: Smalltalk, Pascal, C or Lisp.

Since the 1970s, object-oriented capabilities have been added to Lisp, Pascal, and C. Flavors, LOOPS and CLOS (Common Lisp Object System), have object-oriented enhancements for Lisp. CLOS is being proposed as an ANSI standard. Smalltalk has the reputation of being the purest object-oriented language and contains many concepts derived from earlier work performed in the development of languages like Simula. C++ is an extension of C, and is referred to as a hybrid object-oriented language. There are similar extensions of Lisp and COBOL in the planning stages.

C++, developed at Bell Labs and marketed by AT&T in Morristown, N.J., is rapidly emerging as a de facto standard for object-oriented C. Its nearest competitor is Stepstone, Corp., Sandy Hook, Conn., with its Objective C. The NeXT computer includes Objective C in its programming environment, and IBM has purchased rights to market it.

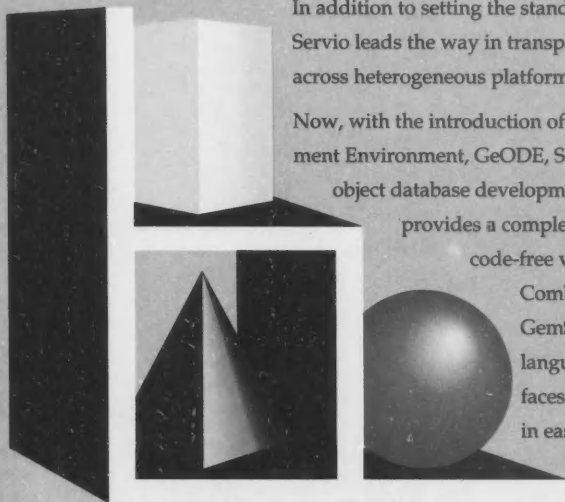
Digital Equipment Corp. has its own object-oriented language, Trellis. Two



The order in which the three aspects, data, process and control, are addressed during the analysis and design of a complex software system is a major distinguishing characteristic of different types of methodologies.

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languages with minor market shares are Actor from the Whitewater Group, Evanston, Ill., and Eiffel from Interactive Software Engineering, Goleta, Calif. Each is unique and proprietary. Ada is sometimes considered an object-oriented language because its packages resemble objects. However, Ada does not support inheritance or dynamic binding.

C++ VS. SMALLTALK

Two languages appear to be the emerging winners in the marketplace. These are Smalltalk and C++. Some companies like Digitalk (Smalltalk V) and Interactive Development Environments (C++), support just one object-oriented language. Others like Parc Place support both.

An IDC user survey reinforces this view. C++ and Smalltalk are the two dominant object-oriented languages at Fortune 500 sites and with vendors who develop software products. The same IDC survey shows that COBOL continues to dominate the programming activities of programmers in commercial operations.

Its use far exceeds any other language, 4GL or CASE product. The relevant question here is, among those interested in object-oriented programming, why is C++ preferred over Smalltalk?

Based on its research, IDC believes the strong support for C++ is concentrated in the community of programmers who develop software products, are involved with more complex, technical applications, are in the advanced technology groups of the Fortune 500, or develop tools and utilities for the internal use of commercial information processing operations. It is these groups that constitute the C user community, and it is the C user community that is generating most of the demand for C++.

These programmers regard C++ as a better C, or in some cases, just as the next revision of C. Having already embraced C, they are far more likely to adopt the hybrid C++ language than to convert to a significantly different language like Smalltalk. The C++ extensions to C are relatively small. That is, well over 90% of C++ is C. With these exten-

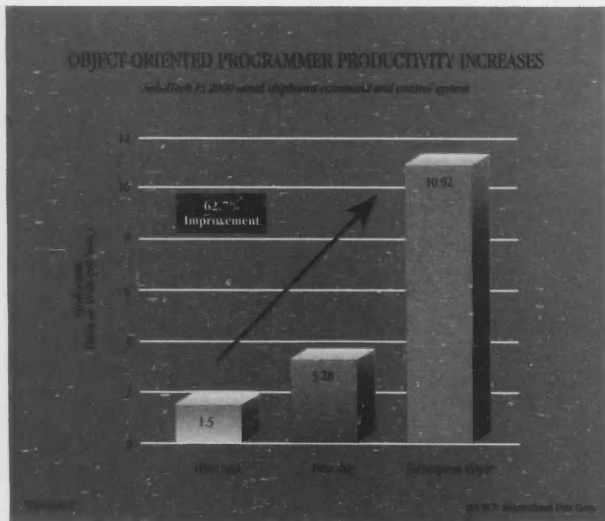
sions, C++ becomes an enhanced C. Stronger type checking is the most common enhancement.

IDC believes that it is still unclear which object-oriented language will be the dominant choice of the average MIS professional, who today finds C very unfriendly. Will Smalltalk enjoy some success in this group, or will an object-oriented extension to Cobol prolong its popularity? It is too early to tell. It is certainly not too early to tell that other important trends, such as increases in client/server applications, will affect the outcome.

One thing that can clarify this is the object-oriented application development environment. These products attempt to provide a level of isolation between the developer and the underlying programming environment. One example is Intellicorp's ProKappa product, which provides an environment and libraries for object-oriented programming in traditional C and C++. A more specialized example is Gain Technology's object-oriented framework that supports visual authoring for developing hypermedia applications. A somewhat different example is Borland's attempt with ObjectVision to reduce the effort encountered when trying to program database applications for Windows 3.0 by shielding programmers from some of the nitty-gritty details that can make their tasks more complicated.

As application development environments evolve, especially to the extent that they provide higher degrees of "visual programming" support, some aspects of application development will become more dispersed from the centralized MIS organization and into the functional line organizations. The object paradigm will facilitate this shift. The MIS organization will have a core of object-oriented (probably C++) programmers who will both acquire, create and manage the libraries of objects, methods and other reusable components that will be relevant to the enterprise. The systems analysts in the line functions will assemble these, using the visual programming user interfaces of the application development environment to create the applications needed to run the business.

Business modeling and business process modeling will play a role. CASE tools and analysis and design methods can be expected to evolve toward supporting various aspects of business process redesign.



NobellTech, which produces command and control systems for the Swedish defense services, projects its object-oriented programming approach to developing software systems for Swedish navy ships will increase productivity 600% over previous methodologies.

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OBJECT DATABASE MANAGEMENT SYSTEMS

To be useful for real-world applications, objects must continue to exist after the program run has been completed. This is referred to as persistence. In some applications this is done with proprietary file systems. More recently, object-oriented database management systems have become a viable alternative. ODBMSs are needed to provide permanent storage for objects. Their data model has objects with the same characteristics as objects in object-oriented programming. Only here the objects are persistent.

ODBMSs are also needed for other reasons, including handling complex data structures and abstract data types, and to support long duration transactions. ODBMS vendors must, therefore, provide both the capabilities of traditional DBMSs, e.g., back-up and recovery, transaction management, security and performance, but also support object orientation, e.g., object identity, encapsulation, types or classes, and inheritance.

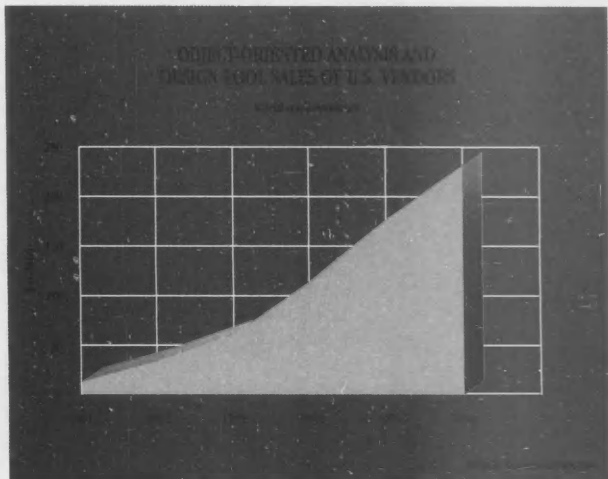
IDC estimates that the market for ODBMSs was \$13.7 million in 1991.

This market will grow to \$446 million by 1996. Applications in the manufacturing industry account for the largest industry segment. Workstations are and will continue to be the platform of choice by a very wide margin.

VENDORS AND PRODUCTS

The market for ODBMSs is emerging rapidly. ODBMS vendors are developing application development tools, porting to new hardware platforms, building interfaces to existing software environments, and enhancing database performance and utilities.

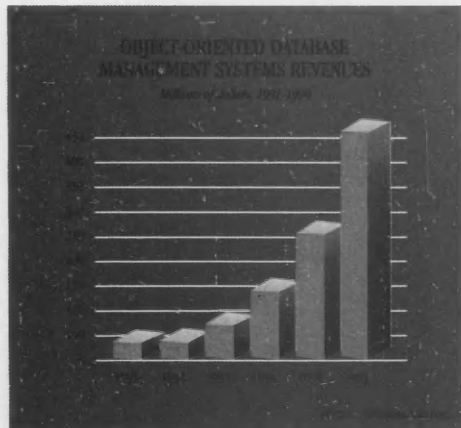
Vendors with existing or announced ODBMSs include Innovative Systems Techniques, Itasca, Persistent Data Systems, O2, Objectivity, Object Databases, Object Design, Ontos, Servio Logic Corporation, Symbolics, and Versant, as well as such major hardware vendors as Hewlett-Packard.



These projected sales increases are in part attributable to the marriage of object-oriented analysis and design tools with computer-aided software engineering packages.

ODBMSs and relational DBMSs can each be enhanced with the other technology. The relational model is suited for

traditional data; the object-oriented model is suitable for text and other data types. At least one vendor, UniSQL, of Austin, Texas, offers a product that combines support for both object and relational data models. Since traditional data is only a minority of the information in organizations, there is a very large market potential for ODBMSs.



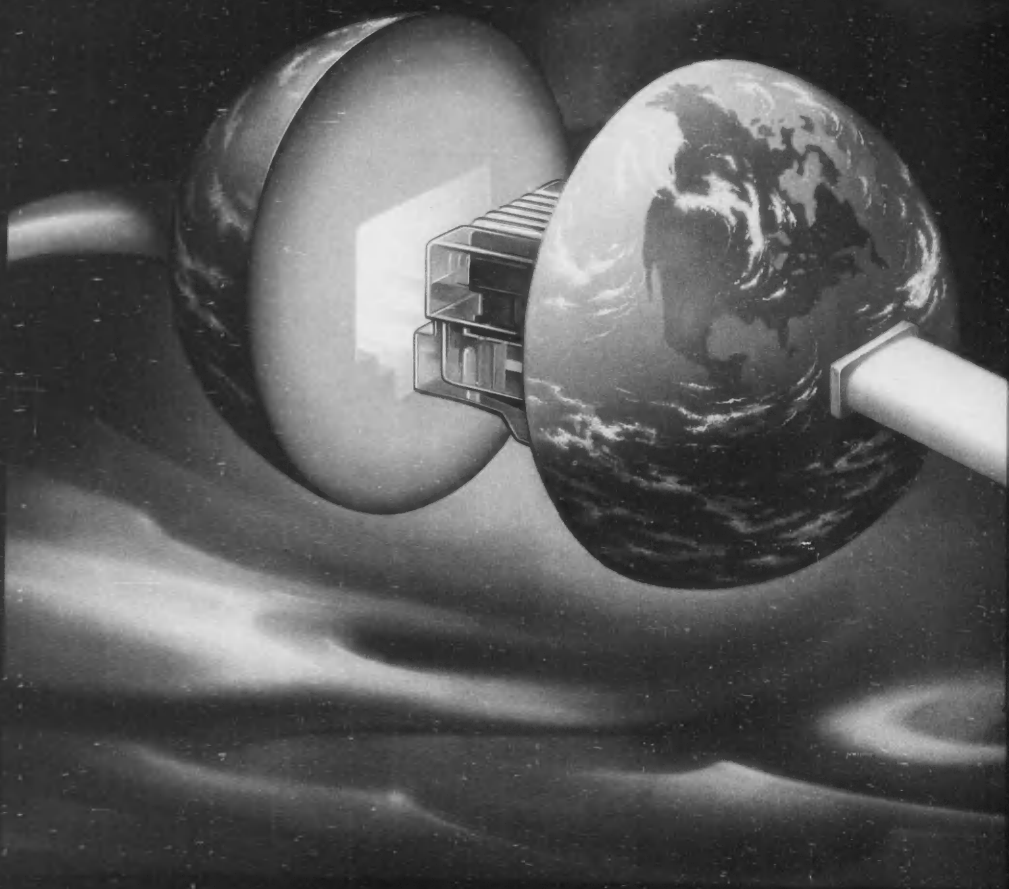
In order to realize these increased sales, object-oriented database management system vendors must provide the capabilities of traditional database management systems along with those of their object-oriented counterparts: object identity, encapsulation, types or classes, and inheritance.

APPLICATION INTEROPERABILITY FRAMEWORKS

Object-oriented concepts can be applied at many different levels. At one end of the spectrum is the idea that whole programs, even whole applications, can be treated like objects. By this we mean they can be treated as a form of encapsulation in which a set of operations is defined for the program. The program then becomes a server object, which will respond to a message requesting the performance of one of its operations. At other times it

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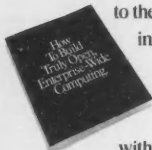
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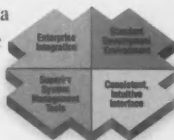


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Object Technology: A Key Software Technology for the '90s

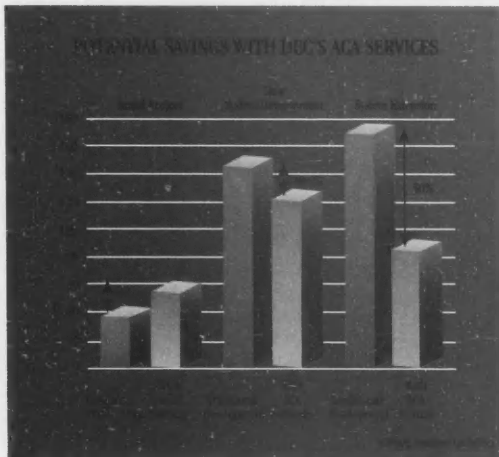
may be a client object, sending a message to another object. This approach allows a gentle transition of existing, non-object-oriented, programs into an object-oriented environment. This is particularly powerful if the environment is distributed across a collection of heterogeneous platforms.

There is no standard name for this type of environment yet, so IDC calls it an object-oriented application interoperability framework. Another term used by some is distributed object management system. The central service is called the Object Request Broker (ORB). The ORB is at the core of this architecture. An application object, or client, sends a message to another application object, or server, requesting some action, e.g., a service of some kind. The ORB fields the request and performs three functions transparently:

- finds the object that will perform the service
- conveys the request to the object and coordinates the receipt of any response
- selects and binds a method to the serving object that performs the requested operation.

The Object Management Group, discussed below, has been a catalyst in standardizing ORB architectures, particularly as they relate to the interfaces in such an environment. This standards activity is becoming a catalyst in the industry, accelerating product development activities at major firms. The result will be a flurry of product announcements in 1992. Among those known to be active in this area are NCR — this is an important element of its "Cooperation" environment — Sun, HP, Digital Equipment and a newcomer, Hyperdesk.

An example is Digital Equipment's ACA Services. The ACA Services are Network Application Support (NAS) software products that provide facilities for integrating independently developed applications and services across a networked, mixed-platform computing environment.



Savings of up to 20% over traditional integration techniques may be realized using DEC's ACA Services.

ACA Services can be used in many application domains, such as CASE, CIM, systems integration, electronic publishing and office automation. Andersen Consulting recently conducted a study that found that it is reasonable for systems integrators to expect potential savings of approximately 20% over traditional integration techniques using ACA Services for new system development. Savings of at least 50% can be expected in reengineering systems.

OBJECT MANAGEMENT GROUP

OMG was formed in 1989 by a small group of vendors and user organizations to create a standard that would support portability of, and interoperability between, independently developed applications across heterogeneous networks of computers. OMG membership has steadily grown and now exceeds 200 organizations, mostly vendors. OMG's staff numbers fewer than 10. The vast majority of OMG's work is carried out by employees of its member companies. The participating companies are investing heavily not only in membership fees but in time and effort as well. This in itself is a clear indication of the importance that these leading vendors are placing on object technology.

GETTING STARTED

When making the transition to object technology, it is wise to do so in a deliberate, evolutionary fashion and awareness that there is a steep learning curve. There are several initial steps to make.

- Secure a financial commitment from top management. Top management should realize that savings will occur in subsequent projects.
- In order to gain acceptance, pick a new project, not a partially completed one. If applications are being downsized or moved to a client/server environment, developers will be more open to object technology.
- Use external training and consulting organizations for the transition to object technology.

- Address the shift in skills mix that must accompany the corresponding shift of activities toward the front end of the software development life cycle.

- Pay attention to administrative issues, i.e. managing class libraries. Consultants can help here.

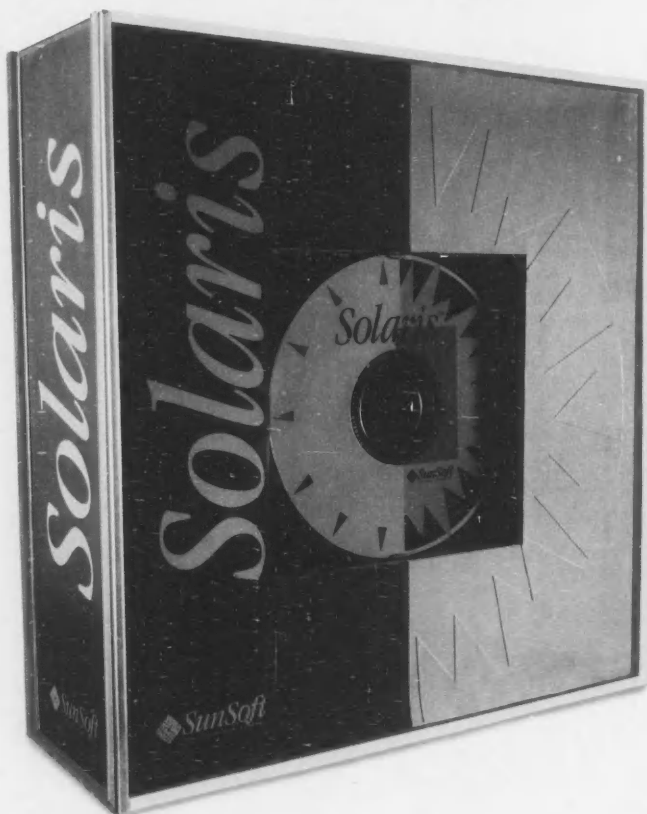
- Encourage systems analysts to use object-oriented analysis and design methods that concentrate on modeling their businesses.

- Reward programmers for creating and using reusable code.

CONCLUSION

Object technology is still evolving, but it is mature enough to put into production. Its impact has been broadly felt in the industry. There is a rich array of products and services now available. The benefits have been conclusively established. They are substantial, but they do require the investment to make the paradigm shift. It is a shift worth making.

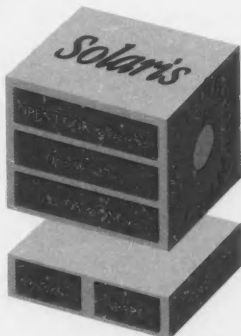
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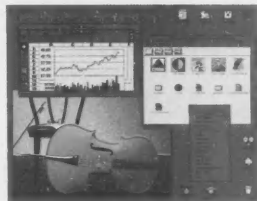
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Midwest

(708) 827-4433

Ellis Bookler, Bureau Chief

Main Editorial Office

One 917, 375 Cochituate Road

Framingham, MA 01701-9171

(508) 875-0700

Fax: (508) 875-8931

MC Mail: COMPUTERWORLD

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FBI endangering privacy for all

MARC ROTENBERG



phone lines will be safe.

Contending that new telecommunications technology will make wiretapping more difficult, the FBI would like to ensure that all communications equipment sold in the U.S. can be wiretapped. Yes, seriously.

It has proposed an elaborate licensing scheme that would be administered by the FCC. Companies that fail to comply with the FBI's rules would face stiff fines. Noncomplying equipment would be prohibited by law.

This is the heavy hand of government at its most leaden. The FBI's proposal is poorly conceived and should be rejected.

Putting last things first

First, by law, wire surveillance is considered "an investigative method of last resort." The 1968 law that permits the government to intercept electronic communications sets out elaborate procedures to restrict the scope of surveillance.

Law enforcement agents seeking warrants for a wiretap are first required to demonstrate that all other investigative methods have been exhausted or could be expected to fail. Agents are then required to indicate the duration of the surveillance, the material sought and the methods they will employ to minimize the

scope of the surveillance.

The reason for these precautions is simple. Wire surveillance is far more intrusive than other types of criminal investigative methods and more prone to abuse. To treat an investigative technique of last resort as a design goal of first consideration is to stand wiretap law in this country on its head.

Honesty not only policy

Beyond that, the risk to network reliability is extraordinary. The FBI proposal works only if the bureau can ensure that no one but agents acting pursuant to lawful warrants will use the technology — and this is a pipe dream. FBI employees were recently arrested for selling confidential information contained in the bureau's National Crime Information Center.

But the FBI's problems with computer security go way beyond the sale of confidential records. A recent audit report prepared by the Office of the Inspector General at the U.S. Department of Justice found major internal control weaknesses with the FBI's computer systems. According to the report, the FBI cannot account for more than 2,000 pieces of automatic data processing equipment, some of which may contain sensitive data and that cost approximately \$14 million.

Another problem is that the FBI's proposal will almost certainly lead to more wire surveillance in the U.S. While the FBI claims that it merely wants to maintain the "status quo," it's clear that the goal is to facilitate remote wiretapping, a type of one-stop shopping for electronic surveillance. This is pretty much what the Stasi (secret police) had going in East Germany.



M. E. Cohen

Finally, the FBI proposal may raise difficult ethical issues for individuals in the computer profession. The Association for Computing Machinery code is very clear on the responsibility of professionals in the computer industry to protect the privacy of the public in the design of infor-

mation systems.

The FBI contends that, if it is not given this new authority, it will fall behind on the technology front. This is hard to fathom. For the past decade, the FBI has spent lavishly on new technologies, even as other agencies were cutting budgets.

The automated Fingerprint Identification System will cost taxpayers more than \$600 million. The genetic database project, which the National Research Council recently blasted, will cost more than \$100 million. We're not talking about leaving the bureau with paper cups and a ball of twine.

No back-room deals

One solution now under consideration in Washington is to encourage the FBI and the telecommunications companies to work out an agreement to "accommodate" the bureau's needs. But this is not the way to make public policy.

Public oversight of communications policy remains crucial, particularly in this area, and back-room deals create their own problems. Credit Congressman Jack Brooks (D-Texas) for holding hearings this past week to look at the FBI's proposal.

Good communications infrastructure requires privacy protection. Without a secure infrastructure, every message that moves across the public network is vulnerable.

Rotenberg is the Washington director of Computer Professionals for Social Responsibility.

DEC helps dig grave for workstation standard

MARTIN HEALEY

The ACE consortium, if it isn't dead, has certainly been mortally wounded. That's a shame, because the industry badly needs a new "standard" architecture to replace the PC. What's most dismaying, however, is that DEC is helping to pull the plug.

ACE always had a number of strikes against it. One was that the members all had their own problems to solve. Another was that it excluded a number of key players — IBM, Apple, Hewlett-Packard, Sun and Intel. (Intel processors were included as an option to the Mips RISC processor, but Intel was not a member.)

The operating system was also a distinct trouble spot, with rival camps developing behind OSF/1, Microsoft Windows NT and Unix Version 4.

Silicon Graphics' acquisition of Mips didn't make the situation any easier, and Compaq's retreat from active involvement was certainly a blow, but when all is said and done, however, a lot of the credit for the demise of ACE really has to go to DEC.

Proprietary puzzle

First of all, when the key player in such an alliance — which DEC unarguably was — produces a product that is essentially proprietary, what chance does a new "open" architecture have for success?

DEC shipped a DECstation, labeled as the "first ACE workstation," that used the R3000 processor, a DEC Turbochannel architecture and its own Ultrix operating system. Future re-

leases could use the R4000 and the new versions of Ultrix, which are OSF/1-based, but it would still be a DEC architecture.

Alpha did it

Now DEC has really put the cat among the pigeons by announcing production of its own Alpha RISC processor chip, which it clearly intends to sell to other manufacturers.

Presumably, DEC — which has been Mips' major processor customer —

hopes, in time, to have Alpha added to the Intel processor and to push Mips out of the ACE specification.

DEC's key claim for the Alpha chip is that it is scalable, by which the company means that a cheap, lower performance component and a much faster component can be produced with the same architecture, which could take it down into the PC sector and up into the supercomputer market. That's a valid claim, and indeed, Cray has already signed

up for the chip.

DEC's press releases, however, have contained some downright ridiculous claims. They call Alpha "an open computing environment," a rather puzzling description for a simple RISC processor. They say, "Alpha is set to become the new standard in computing." (I wish them luck, but have to wonder whether anyone has told Intel et al.)

Most puzzling is the boast that "Alpha is the first microprocessor with the ability to run different operating systems." I thought DEC could run VMS or Ultrix on a VAX. Perhaps I was mistaken. I do know for certain, though, that IBM can run MVS and Unix on the same machine.

I wish DEC well with what looks like a super product, but I can't help feeling just a little bit sad that instead of a new standard architecture, we'll have to settle for another RISC processor — albeit an "open" one. R.I.P., ACE.

Healey is a consultant based in Cwmbran, England.



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DESKTOP COMPUTING

PCs AND SOFTWARE • WORKSTATIONS

SPSS powers desktop tools

SPSS for Windows packages analytical engine with graphical interface

BY CHRISTOPHER LINDQUIST
CW STAFF

CHICAGO — SPSS, Inc. said it has harnessed the analytical horsepower of its mainframe-based statistical engine and put it under a Microsoft Corp. Windows chassis to create its next generation of analysis tools.

SPSS for Windows, due to ship late next month, fully implements the SPSS analytical engine, unlike the previous DOS version, SPSS/PC+, which was first released in 1984.

"It's much better than the PC [DOS] version," said Zvia Naphthali, president of New York-based Resource Mobilization, Inc. and a SPSS for Windows beta-test user. "I think it's their best product."

Naphthali said she has been using SPSS' products since 1975 for analysis work. She was particularly impressed with the way

in which graphics are now integrated into the system rather than requiring the user to jump to an external graphics package.

Harry Conley, a sampling statistician at the U.S. General Accounting Office, was also impressed with the product, citing the much improved interface and the ability to cut and paste information using the Windows clipboard. "It works real well," he said.

More user-friendly

The ease of use of the product may help increase the audience for SPSS, said Clare Gillan, manager of applications solutions at International Data Corp. in Framingham, Mass. "They always had a product for hard-core analysts; now they can broaden their market," she said. "I like the power of SPSS, but it was in dire need of a user interface."

One other aspect of the new

SPSS is its flexibility and extensibility. A new feature may allow SPSS to provide more "solution-oriented" applications for specific businesses by adding more modules to the base SPSS for Windows package. The new vertical applications could leverage the common Windows interface with the underlying power of the SPSS engine.

The "building block" approach may also give users confidence that the product will grow with their requirements. "You needn't fear that you'll outgrow it," said Jack Noonan, SPSS' president and chief executive officer.

SPSS for Windows comes in a base configuration for a list price of \$695. A special promotional price of \$395 is available until Sept. 30. The base system includes data manipulation, file management and data editing features and can read data in

Still counting

SPSS, Inc. currently has its statistical analysis software running on more than 60 mainframe, minicomputer, Unix workstation and PC platforms

- 1966** First version of Statistical Package for the Social Sciences (SPSS) created by Norman H. Nie and C. Hadlai Hull for IBM 709T systems.
- 1968** Company that will become SPSS is founded by Nie and Hull. First IBM mainframe version for IBM 360 released.
- 1975** SPSS, Inc. incorporated by Nie and Hull.
- 1977** First DEC VAX version released.
- 1984** SPSS/PC+ introduced for DOS-based PCs.
- 1987** First Unix version of SPSS ships.
- 1989** IBM OS/2 version released.
- 1990** SPSS for the Macintosh introduced.
- 1992** SPSS for Windows unveiled. Entire functionality of mainframe product ported to PC platform under a graphical user interface.

CW Chart: Janell Genovese

such formats as SPSS, Microsoft's Excel, Lotus Development Corp.'s 1-2-3 and Borland International, Inc.'s dBase.

A Professional Statistics

module (\$395) is also due to be available in June. Other modules, including Advanced Statistics, Tables, Trends and Categories, will be available later in 1992.



McKesson warehouse workers can refer to computers attached to their forearms for customer orders, freeing hands to pack boxes

McKesson Drug curing inaccuracy of warehouse labor with wearable PCs

BY JAMES DALY
CW STAFF

SAN FRANCISCO — First, personal computers got smaller. Then they got lighter. Now you may not even need your hands to operate one.

At McKesson Drug Co., a pilot program has tested out a new wearable PC that can be used by warehouse workers to track deliveries, increase the accuracy of customer shipments and generally improve the quality of service at the \$10 billion pharmaceuticals distributor.

Weighing less than 13 ounces, the AcuMax fits over the hand and forearm and contains a small screen and keypad. Workers thus have their hands free to carry boxes while tracking goods as they are received, assembled to fill orders and shipped to drugstores and hospitals nationwide.

"We're trying to create a paperless warehouse," company spokesman Jim Cohune said. "It replaces the guy who walks around with a pencil and clipboard hoping he gets things right," he added.

Unlike other technologies in

search of a problem, AcuMax was dreamed up by McKesson's workers and managers. The system was then developed with the aid of Symbol Technologies, Inc. and Electronic Data Systems Corp., which hope to market it to other warehouse and distribution companies later this year.

Starting a trend

The AcuMax is also at the forefront of a new generation of wearable computer systems. Grid Systems Corp. recently used a squad of New York

Continued on page 61

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IN BRIEF

Compaq slashes portable line prices

■ **Compaq Computer Corp.** recently cut prices on and expanded the high end of its portable line by introducing the P486 luggable.

The 17.6-pound P486 is the same as Compaq's 486C color luggable except its active-matrix screen is monochrome, and it costs \$5,899 — almost \$3,000 less than the new \$8,699 price for the same model with an active-matrix color screen.

A Compaq official said the company made its pricing move and family expansion to attempt to stay competitive in the AC-powered luggable market.

■ **Lotus Development Corp.** began shipping an upgraded version of its 1-2-3 for Unix System V. The latest 1-2-3 comes with improvements in data access, operating system compatibility and peripheral support, according to company officials.

■ **Seagate Technology, Inc.** announced it would ship many of its hard drives with preloaded **Microsoft Corp.** Windows 3.1 software.

■ **Cardinal Technologies, Inc.**, a Lancaster, Pa.-based maker of personal computers and add-in boards, announced

the PC15, a 386SX-based PC with an integrated monitor and CPU base.

The PC15 is based on **Advanced Micro Devices, Inc.**'s 33-MHz 386SX. It will include **Novell, Inc.**'s DR DOS, offer IBM Video Graphics Array

compatibility. The product sells for \$1,300.

■ **Lotus Development Corp.**'s CC:Mail Division expanded its support of the IBM world earlier this month by announcing plans to resell IBM

Systems Network Architecture Distribution Services (SNADS) to CC:Mail gateway, which is marketed by **LinkAge, Inc.**

The gateway will allow a direct connection between CC:Mail and SNADS-compliant systems, including such IBM office host platforms as OfficeVision/400 and OfficeVision/MVS.

■ **Peachtree Software plans**

to use Lotus' **SmartText 2.0** for Windows to provide on-line reference tools in its next release of its accounting software. **SmartText** is a hypertext tool for building and reading on-line documentation.

Peachtree will provide such reference tools as **The Accounting Primer**, **Glossary** and **Tutorial** in **Peachtree Accounting for Windows**.

Windows help on CD-ROM

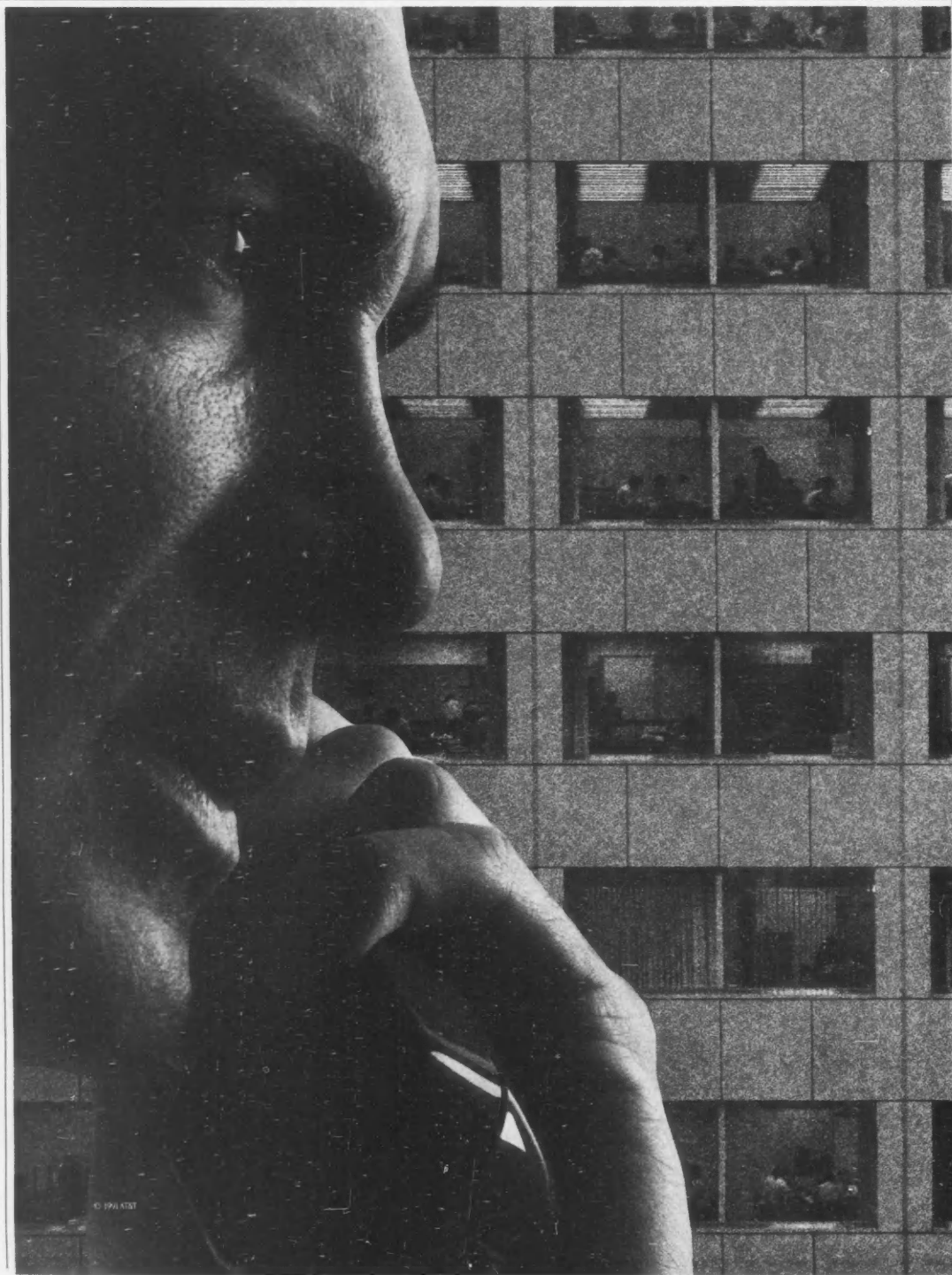
With more than 10 million Windows users worldwide, getting through to Microsoft Corp.'s Windows technical support can be time-consuming and costly. So San Jose, Calif.-based **M'aidez, Inc.** has decided to cut out the middleman, Microsoft, by putting technical support information on compact disc/read-only memory (CD-ROM).

Helpdisq for Windows is an indexed CD-ROM that is updated monthly with the latest information on supporting multiple software packages that run on Windows.

In particular, **Helpdisq** assists users who are moving from Windows 3.0 to 3.1 to maintain application compatibility. Currently, more than 200 vendors have supplied information to **M'aidez** for use in **Helpdisq**.

Helpdisq is slated for availability later this month for an annual subscription price of \$1,495. The base price provides 12 monthly issues for use on one workstation or by as many as three local-area network users.

A site license is available for approximately \$3,900. Windows 3.0 or 3.1 and a CD-ROM reader are required.



Curing inaccuracy of warehouse labor

CONTINUED FROM PAGE 59

fashion models to demonstrate a machine called the PalmPad that can be strapped to the user's wrist. Additionally, Japan's NEC Corp. has shown a similar wearable machine designed for paramedics.

McKesson plans to use the

AcuMax at many of its 45 distribution centers nationwide, each of which stocks upwards of 20,000 items available at the local drug store: aspirin, shampoo, razor blades and so on. "We're the stockroom for the neighborhood pharmacy," Cohune said.

Typically, a druggist will electronically place an order with McKesson by sending it via modem to the company's computer center in Rancho Cordova, Calif. The order is then relayed to the McKesson distribution center nearest the store. Workers then

complete the order by filling plastic tote boxes with the ordered products, which are shipped overnight to the customer.

"We need to pick orders accurately and quickly," Cohune said. "But unfortunately, it's a business of 'oneseys' and 'twoseys,' and things can get confused."

At any complex distribution center, however, the chore of

tracking millions of individual items as they shuffle from forklifts to tote boxes is extremely complicated and vulnerable to human error. The bane of the distribution function is mispicks that occur when orders get scrambled or miscounted. When a drugstore orders 20 bottles of Ex-Lax and 20 bottles of Kaopectate arrive, there is a problem.

Cohune said he estimates that each mispick costs about \$80 in lost time and shipping costs — seven times more than filling a customer's order correctly the first time. After a two-month pilot program at its Spokane, Wash., distribution center, McKesson estimated the AcuMax cut mispicks by more than 50%.

Before AcuMax, McKesson tried to rely on pistol-shaped

"WE'RE THE STOCK-ROOM for the neighborhood pharmacy."

JIM COHUNE
MCKESSON DRUG

bar-code readers. But because these portable scanners require one or more hands to operate, they never really caught on in a warehouse where workers need both hands to do their jobs.

"It is inefficient to holster and unholster a hand-held scanner for each action," said Douglas Thompson, senior vice president of distribution services. "The warehouse employee must be able to electronically read bar codes to verify the incoming order against the purchasing order, while keeping both hands free to lift and move shipping containers."

Communication is key

AcuMax relies on constant two-way radio communication between the human pickers on the warehouse floor and a database in the warehouse's IBM Application System/400 minicomputer. The picker wears a scanner glove that is activated by pointing an index finger at the customer's bar-coded shipping label. The AS/400 transmits the customer's shopping list to a small display screen mounted on the picker's forearm, which includes the exact location of the item to be picked.

The picker goes to the case lot and confirms the order by using laser beams from the AcuMax to read data on bar codes up to 20 feet above the warehouse floor.

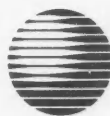
The picker then selects the appropriate number of items for the tote, the next shelf location shows up on his forearm, and the cycle begins again.

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COMMENTARY

Michael Fitzgerald

Here comes 2.88M bytes



IBM's new Personal System/2 Models 56 and 57 have raised some eyebrows: They come standard with 2.88M-byte floppy disk drives. The highest density floppy disks will hold 1.44M bytes of data (IBM's drives will read 1.44M-byte and lesser capacity disks), so the new drives seem somewhat superfluous.

Not so, says Sigmar H. Tullman, director of marketing at BASF. "We've got these products ready to go. Our competitors have products ready to go. It's a case of having tires before the car is ready."

Toshiba America Electronic Components also expects to see 2.88M-byte disks as a big new product, issuing a release predicting that by year's end, virtually all systems makers will offer 2.88M-byte drives.

Hot potatoes

IBM's 386SLC is barely out the door, but the company is pushing forward with its 486SLC. This next product is already ready to

go. Its features include a cache that is double the size of that in the 386SLC in a smaller die factor and a 20/40 clock doubler. IBM says it might come out with chips that run at clock tripled or quadrupled speeds in the not so distant future. One possible concern: What to call a 486SLC? Cyrix just introduced its own microprocessor — dubbed the 486SLC — and IBM does not trademark names.

Speaking of Cyrix

Richardson, Texas-based chip maker Cyrix had a busy suite in Chicago, away from the Comdex/Spring '92 show floor. Engineers from such companies as Zenith Data and NEC Technologies popped in for high-level meetings, and Cyrix boasted that it is close to agreements with 15 hardware vendors, beyond the four already planning to use its chips.

Cyrix also had systems on display that use its unannounced DX version of the 486SLC. As of press time, however, none of these deals had officially borne fruit.

Battery breakthrough

AER Energy Resources, a start-up based in Atlanta, will begin selling what could be a breakthrough for portable users: a battery that lasts for eight hours. AER said it will retail a zinc air battery that will provide four times the energy of a nickel cadmium battery (thus four

times the life), for the same weight.

The initial version will retail beginning this summer and can be used by plugging into the DC-volt slot. AER will then go after OEM accounts because the battery does not fit in the standard NiCad slot.

A Lilliputian PC

While NCR had little to do with its NCR System 3170 notebook computer — the next NCR portable product will be a joint development, said Ed Cote, now director of product management and marketing for the NCR notebook group. Cote said the product will be a sub-notebook with at least an 80M-byte hard drive in it as well as some of the fifty communications facilities of the 3170. The product will appear in 1992 but probably not until late fall.

Calling the South Pole

On tap at Zenith Data are pen-based systems, according to sources near the company. One, which is based on Intel's 386SL, has an internal code name of Penguin and is slated for release later this year. Zenith Data is also developing a 1486-based pen system, but this will not ship for some time, either, and waiting in the wings is a combination pen- and keyboard system.

Putting a good face on

Intel is out to once again prove it is adept at turning bad cards

Acer hits market with line of entry-level PCs

BY CAROL HILDEBRAND
CW STAFF

Direct-market personal computer makers are turning from the hounds to the hounded, as top-tier vendors counter with entry-level lines aimed directly at the mail-order mavens. The latest example comes from The Acer Group.

The San Jose, Calif.-based company recently announced AcerMate, a line of PCs that will be carried through Acer resellers, but, according to the company, would be priced aggressively enough to compete with such vendors as Dell Computer Corp. and Gateway 2000 — two well-known direct marketers. Among the resellers is Computerland Corp., which picked up Acer's products in late March.

Lower pricing

"We're offering products within 10% to 15% of mail-order pricing, which makes it a very attrac-

tive offer," said Olend King, director of product marketing at The Acer Group. King said the price cuts are made possible in part through a new design that features a screwless snap-together housing that is more efficient to manufacture, as well as a highly integrated motherboard, video and chassis.

The line of PCs, which King said were designed and manufactured by Acer rather than parceled out to a low-cost partner, consists of six models ranging from a 16-MHz 386SX model available now to a 33-MHz 486 box slated for second-quarter availability. The 386SX/25 is also slated for second-quarter availability. All other models are currently shipping.

The company's suggested list prices are as follows: the 386SX/20N, a diskless network model, \$795; the 1116/SX, \$895; the 386SX/25, \$1,095; the 1125E, \$1,695; the 386/33, \$1,995; and the 486/33, \$2,295.

into good ones. This time, sources say, it took advantage of a flaw in its 386SL chip and announced it as a low-cost version of the SL. When the chip appeared a few weeks back, one source at a major hardware

vendor said that this was "just another Intel marketing gimmick" for a product that needed some "corrections."

Fitzgerald is a *Computerworld* senior writer.

NEW PRODUCTS

Software applications packages

PenMagic Software, Inc. has announced Numero, a financial word processor for pen computers.

Financial-related jobs such as writing sales orders, preparing expense reports, analyzing deals and making presentations are all functions of Numero. Tasks are performed on pieces of "work paper," which users design to look like real paper. Users can write, erase and highlight directly on the work paper and, with Numero's PageMap, navigate large pieces of work paper, magnify the page, and scale it to fit on a screen of any size.

Numero's paper design capability provides numerous columnar grids per page, eight different data types, and the ability to specify the page layout with lines, fonts and graphics. It is priced at \$399.

PenMagic Software
310-260 West Esplanade
North Vancouver, B.C.
V7M 3G7
(604) 988-9982

Imara Research Corp. will begin

shipping Imara Lite, a productivity tool for stand-alone personal computers.

Imara Lite combines image capabilities, fax processing and document management. Peripheral options include a laser printer, fax modem, scanner, optical disc and imaging board.

Imara Lite runs under Microsoft Corp.'s Windows on a standard PC and requires no network operating system or database server.

Imara Lite costs \$295.

Imara Research
Suite 804
111 Peter Street
Toronto, Ontario M5V 2H1
(416) 581-1740

Timeslips Corp. has announced Timeslips 5 for DOS, an expense tracking, billing and accounts receivable system.

Timeslips 5 assists executives in keeping track of time and expense charges. It has software that provides management reports for budgeting and accounting processes. Two modules divide Timeslips 5: TSTimer and TSReport.

TSTimer records time and expense charges and tracks employees' daily activities.

TSReport provides custom

reports, data analysis, graphs and project status from the time and expense records produced in TSTimer.

The single-user version costs \$299.95. A two-user network version costs \$599.95, and a package of three additional networked stations costs \$349.95.

Timeslips
239 Western Ave.
Essex, Mass. 01929
(508) 768-6100

Software utilities

Fifth Generation Systems, Inc. has created Direct Access for Windows 1.0.

Direct Access provides a flexible structure for grouping programs under the Microsoft Corp.'s Windows Program Manager. It allows users to launch applications with a single keystroke or click of the mouse and offers password security and application usage monitoring.

The product costs \$99.
Fifth Generation Systems
10049 N. Reiger Road
Baton Rouge, La. 70809
(504) 291-7221

Atech Software, Inc. has created AllFonts, a typeface collection for personal computers.

AllFonts for Home and All-

Fonts for Business each cost \$79.95 and include italic, bold, bold italic and hollow styles. In total, 400 typefaces can be produced. Both versions support all major PC application software.

Atech Software
Suite 125
5964 La Place Court
Carlsbad, Calif. 92008
(619) 438-6883

Macintosh products

Attain Corp. has introduced In Control, a to-do list manager for the Apple Computer, Inc. Macintosh.

In Control gives users the ability to collapse and expand their hierarchy and use other organizational features such as Sort and Match buttons. The application is both System 7.0 and 32-bit compatible and supports virtual memory. It costs \$129.95.

Attain
5 Irving Terrace
Cambridge, Mass. 02138
(617) 547-2188

Peripherals

Canon U.S.A., Inc. has introduced LBP-4 LITE, a laser beam printer.

It is a 4 page/min. unit that of-

fers 300 dot/in. output and comes with eight bit-mapped and nine scalable fonts. Two integrated circuit-card slots, one scalable and three bit-mapped font cards are offered. The printer has 512K bytes of random-access memory, which can be expanded to 2.5M bytes. It has a receiving buffer size of 1K byte.

The price of the LBP-4 LITE is \$1,249.

Canon U.S.A.
One Cannon Plaza
Lake Success, N.Y. 11042
(516) 488-6700

Data storage

Storage Dimensions has introduced the Tape 5000 for the Apple Computer, Inc. Macintosh. The product is an 8mm-tape subsystem that allows up to 5G bytes of unsupervised backup per cartridge.

Tape 5000 offers a 500 K byte/sec. data transfer rate and a search speed rate of 37.5M byte/sec. The unit uses 8mm helical scan technology and has a mean-time-between-failure rating of 40,000 hours.

Prices start at \$6,459. Additional cartridges cost \$59 each.

Storage Dimensions
1656 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 954-0710

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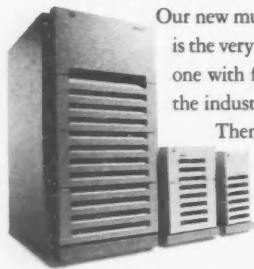
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WORKGROUP COMPUTING

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IN BRIEF

Unisys to up LAN efforts

■ **Unisys Corp.** Chief Executive Officer James Unruh said recently that Unisys expects to nearly double the revenue it gains from local-area network services in 1992. A new national LAN services organization with 170 network engineers will support that effort, Unruh said. Unisys also announced the U 6000/15 as a low-end multiuser system based on the 33-MHz Intel Corp. i486 microprocessor. The U 6000/15, priced at \$8,700 for a minimum 16M-byte configuration, is shipping now. The firm also enhanced the U 6000 Models 75 and 85 with 50-MHz 486 dual-processor CPU boards from Intel. The models are priced from \$109,000 to \$348,000.

■ **Wyse Technology, Inc.** recently expanded its Unix efforts, releasing the 6000I Model 640, a workgroup-oriented Unix server based on Intel's 33-MHz 486DX chip, and offering a kit that enables its Decision 386/40 personal computer to act as a Unix server. The base version of the 6000I costs \$9,625. The Unix kit is \$4,175.

Amoco storage server clears net snag

BY MARYFRAN JOHNSON
CW STAFF

CALGARY, Alberta — Migrating from a pair of IBM 3090 mainframes to a Unix-based network of workstations and servers posed a new problem for Amoco Canada Petroleum Co.: network data overload.

Every time a network server reached the limits of its disk storage capacity, work ground to a halt for several of Amoco's geologists and geophysicists. With individual file sizes ranging from 1M byte to more than 200M bytes of seismic data, the file servers were frequently overwhelmed.

"The server would just shut down and go into a wait state," said Jim Stuart, general manager of Amoco Canada's exploration systems and services. "This would leave anywhere from six to 20 angry workstation users connected to that server waiting for something to happen."

"We tried to move data around to different servers, but that just didn't work well," he added.

Amoco's answer was to install an Epoch-1 InfiniteStorage server from Epoch Systems, Inc. in Westboro, Mass. The server runs Epoch's data management software, called Renaissance Migration Services (RMS), to auto-

mate and manage storage of massive data sets.

"This gives our users relatively immediate access to data that used to take a day or two to get," Stuart said. "We couldn't take it away from them now."

By late summer, this division of Chicago-based Amoco Production Co. will be entirely converted from IBM 3090s to a 100-plus workstation Sun Microsystems, Inc. network.

"We're going to open systems because the cost of central IS and mainframe computing is too high," Stuart explained. "The rest of our corporation is

going the same way."

The exploration division — responsible for all oil and gas exploration in mainland Canada and

offshore areas — provides equipment, research and development work and computer

Continued on page 67

Lotus offers Notes library

BY ROSEMARY HAMILTON
CW STAFF

Lotus Development Corp. late last month introduced a set of applications for its Notes software that was designed to give users a jump-start in creating programs for its workgroup platform.

The Notes Application Library has 50 applications that can be used as is or customized to meet a user's needs. It includes such programs as Budget Planning and Problem Tracking. The library will be shipped to Notes users free of charge.

Lotus also expects the library to better define Notes by highlighting some of its capabilities, said Eric Sall, director of product and application marketing for Notes. "Since introducing Notes, when some people asked what it is, they often have a hard time getting an idea of what Notes is," Sall said.

One Notes user is anxious to get a copy of the Application Library in the hope that it will shed more light on Notes development techniques.

"Notes is somewhat lacking in terms of documentation for how you do the coding and build features into your apps," said Margaret Whack, a senior planning consultant at Metropolitan Life Insurance Co. in New York.

Whack said Met Life's Notes users can easily develop simple applications within the workgroup environment with the prototyping tools. "You can really easily and quickly build screens and get an app up," she said.

Some assembly required

Met Life has also developed several complex applications to take advantage of the document management features in Notes. But these projects have required more effort. "When it comes to the high road," Whack said in reference to mission-critical applications, "you begin to find Notes is lacking."

Whack said the staff would like to examine the Lotus applications so "we could take a look at how they wrote the code."

"One of the uses would be a training tool to improve our development skills," she added. "Also, we could use them as a template so we wouldn't have to start from scratch."

Sall said he expects the library will give users a better understanding of what Notes can do.

Chase Manhattan Bank NA, a longtime Notes user, is not expecting to implement many of the applications in the library, but the bank hopes to use it as a source of development ideas.



Amoco Canada Petroleum Co.
Calgary, Alberta

• **Challenge:** To deal with inadequate storage capacity on Unix-based network servers, after migration from two IBM 3090 mainframes.

• **Technology:** Epoch Systems' Epoch-1 InfiniteStorage server running Renaissance Migration Services software now automatically handles network storage for more than 100 Sun workstations and servers.

• **Result:** Immediate on-line access to seismic data and other information formerly stored on 9-track magnetic tapes at off-site warehouse.

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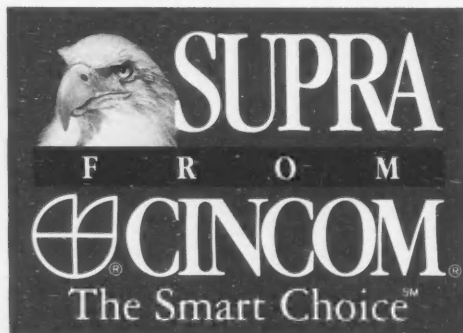
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Amoco server clears net snag

CONTINUED FROM PAGE 65

technologies to scientists and engineers who explore for oil.

"About 15G to 20G bytes of seismic information are added to the network each day," said Ernie Shulz, an exploration systems analyst at Amoco Canada. "If you have a couple projects going at the same time, we can quickly generate hundreds of gigabytes worth of files, yet users only really need to keep a small percentage of those files active."

Unbeknownst to users

Based on file usage patterns, the RMS software migrates data transparently up the storage hierarchy from Sun 600MP servers to the Epoch-1's magnetic disks. Once those disks reach capacity, the software automatically transfers inactive files to optical discs.

Users, however, never see the difference. When they call for access to an archived file, the system retrieves it from the optical disc and copies it back into the user's server directory.

For their largest data sets, researchers use their networked workstations to remotely access a Cray Research, Inc. supercomputer at the Minnesota Supercomputing Center, Shulz said.

Amoco Canada's data was formerly stored in different sites around Calgary on 9-track magnetic tapes. When the scientists wanted to examine the data, the process took a few days to fetch the tapes, convert and reload them.

The original use of the Epoch system for network file system management changed as the mainframe migration hit full stride, however.

"We found that as a huge archival storage manager, it's more valuable to us," Shulz said. "Right now, one of its primary functions is for displaying large archival

files of visual data. We're loading at least 150G bytes of this stuff now. We've already converted about 7,000 9-track reels."

Once the archival files are all loaded, within the next few weeks, the Epoch's file management functions will be reconnected to the servers, he added.

The exploration division also maintains a library of satellite data, such as images of oil field terrain. Using Epoch's erasable optical and write-once, read-many optical discs, the information systems staff has been able to create a large storage repository for satellite image data.

"Users can pull the image files off as flat files and process them at their workstation or use them for display," Stuart noted.

Arcserve gains SCO, Mac support

Cheyenne Software, Inc. is following Novell, Inc.'s lead by adding support for The Santa Cruz Operation's Unix and the Apple Computer, Inc. Macintosh on its back-up and restore software.

Roslyn, N.Y.-based Cheyenne said its Arcserve for Novell NetWare 3.1 will support Unix System V/386 Release 3.2. Cheyenne's software focuses on NetWare.

Arcserve already supports DOS, OS/2 and Microsoft Corp.'s Windows. Sold separately as Macagent and Unixagent at \$495 per server, it is available now.

During the last year, Novell has aggressively moved into both the Unix and

Macintosh networking markets. Macintosh and Unix support lagged behind Novell's move in those directions, according to a Cheyenne spokeswoman, because the firm's customer base has demanded automation features delivered in Arcserve Version 4.0, rather than support for new operating systems.

Having delivered those with 4.0, the spokeswoman said, Cheyenne is addressing further support. Work is under way to expand support initially to AIX, IBM's version of Unix. Cheyenne will not develop software for versions of SCO Unix earlier than 3.2.

JIM NASH

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July 14 - 16, 1992
San Jose, California

Smooth client/server takeoff at United

Moving off mainframe eases scheduling of airline's 8,000 pilots, 17,000 flight attendants

BY GARY H. ANTHES
CW STAFF

CHICAGO — United Airlines has few systems as mission-critical — or as computationally demanding — as the one that plans the monthly itineraries of its 8,000 pilots and 17,000 flight attendants. When the airline moved the crew-scheduling application from a mainframe to a client/server environment, it not only saved millions of dollars in computer costs but also gained qualitative improvements in its schedules.

Although United officials said they are happy with the cost savings and increased user productivity brought about by the shift to distributed computing, they said that moving the application out of the glasshouse has caused the airline some problems that are only slowly being solved.

Similar to chess

Because there is an astronomical number of combinations of United planes, crews and cities, testing every alternative for a monthly schedule and then picking the best is beyond the computational feasibility of most computers. However, the more combinations a scheduling program can test, the better it performs, just as the best chess-playing computers are the ones that can evaluate the most moves in advance.

United's model, called Paragon, seeks to minimize the amount of paid time that crews spend waiting for flights. But as

in chess, not all moves are permitted; the model must also factor in constraints such as union rules and Federal Aviation Administration regulations.

Subhash Desai, a research an-

and \$4.5 million, Desai said.

Now, each of the 14 scheduling analysts gets his own dedicated processor on a multiprocessor Silicon Graphics, Inc. computer on an Ethernet local-

schedules any faster now than they did when they used the mainframe, but they have more time to perfect them. He said United expects to save between \$1 million and \$1.5 million annually just by having more efficient schedules. United spent a little less than \$1 million on labor and hardware for the new system.

Despite those happy results, the airline has discovered that

years of experience."

The front end was put on Unix-based IBM RISC System/6000 workstations using SAS Institute, Inc. products for data entry, editing and file management. An analyst uses SAS to set various parameters, then initiates the number-crunching Fortran model on the Silicon Graphics server and gets results back in SAS on the RS/6000.

The SAS front end is accessed via Network Computing Devices, Inc. terminals running under the X Window System. "We've made it so users don't have to know the first thing



UNITED'S MODEL, CALLED Paragon, seeks to minimize the amount of paid time that crews spend waiting for flights. But as in chess, not all moves are permitted.

moving from a monolithic mainframe to a heterogeneous, multi-vendor LAN has presented some difficulties. "We have had a challenge supporting the Unix environment and the network," said Maryanne Deaton, manager of corporate research and development. "This is the first or second application of its kind at United Airlines, and the support people in MIS have struggled to come up to speed."

When asked if the new environment offered reliability and security safeguards equivalent to those in the mainframe data center, Deaton said, "We are extraordinarily optimistic and hopeful, but that is exactly the issue we are dealing with now. We tried to get that squared away in the beginning, but on the mainframe side, there's 20 to 30

about Unix," Greenfield said.

The application produces individual trip schedules where a trip might, for example, involve a Chicago-based crew completing a three-day round trip that includes Las Vegas, Los Angeles and Seattle. Those individually optimized trips are then put together into trial monthly schedules, called lines, by another application running on a Prime Computer, Inc. minicomputer.

Called the Selective Bidding System (SBS), that application produces alternate itineraries on which pilots and flight attendants can bid. First choices go to the most senior people. Like the IBM mainframe, the Prime is also getting crowded, and United plans to move the SBS to RS/6000s on the LAN as well, Greenfield said.

alyst at United, said the application was moved off an IBM 3090/600 mainframe because it could not get enough processing cycles. One process — scheduling the domestic narrow-bodied fleet of planes — took 150 to 200 hours of CPU time per month, he said. Moving the application allowed United to avoid a mainframe upgrade that would have cost between \$3.5 million

area network. The analysts work on a monthly schedule two or more months in advance, tweaking and fine-tuning it continually, said Steve Greenfield, systems analyst. "They'll run it time and time again. Sometimes they'll let the job run for two minutes and sometimes for the entire weekend," he said.

Desai said the analysts do not necessarily produce their final

NEW PRODUCTS

Peripherals

Western Telematic, Inc. has designed new plug-in printer sharing cards for the Hewlett-Packard Co. LaserJet.

The LaserNet ShareCard is offered in three models. The SC-6 provides six serial inputs, the SC-7 has six serial and one parallel input, and the SC-10 has 10 serial inputs. ShareCards plug into the Optional I/O slot on the HP LaserJet.

Pricing starts at \$495 for the SC-6. Western Telematic 5 Sterling Irvine, Calif. 92718 (714) 586-9950

Software applications packages

Lucas Management Systems, Inc. has announced Artemis Prestige for Windows Version 1.1, a client/server project man-

agement software package.

Prestige for Windows handles multiple users and multiple concurrent projects. It supports standard databases from Oracle Corp. and Gupta Technologies, Inc. running on a host Digital Equipment Corp. VAX or a local-area network server.

Pricing starts at \$6,295 on a LAN server, \$10,475 on a VAX. Lucas Management Systems Suite 350 12701 Fair Lakes Circle Fairfax, Va. 22033 (703) 222-1111

Local-area networking hardware

Proteon, Inc. has introduced the ProNet 4/16 P1392 Token Ring adapter, which includes upgradeable flash memory.

The card works with IBM AT/XT-based personal computers and features the company's RapiDriver software for en-

hanced performance. It also supports Microsoft Corp.'s Windows and extended memory managers running on the PC.

The flash memory allows users to upgrade the product via software rather than by replacing read-only memory hardware. The adapter costs \$795.

Proteon 2 Technology Drive Westboro, Mass. 01581 (508) 898-2800

IMC Networks Corp. will introduce its TP Hub/16 at Interop Spring '92 next week.

The TP Hub/16 is a 16-port 10Base-T Ethernet hub. It provides 16 RJ-45 ports, built-in backbone connection options and a universal power supply. It supports IEEE 802.3 standard network interface cards at distances up to 328 feet.

The hub can be daisy-chained to expand the network.

TP Hub/16 is priced at \$995.

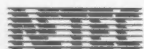
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Pathworks lures users

BY ELISABETH HORWITT
CW STAFF

BOSTON — Wide-area network connectivity, tighter security and corporatewide document management are among the features that are tempting users to enhance their existing local-area network environments with Digital Equipment Corp.'s Pathworks.

Users who hovered around the Pathworks booth at the DECworld '92 conference here recently were particularly interested in DEC's claims that its upcoming Novell, Inc. NetWare version of Pathworks would add significant capabilities over their

Continued on page 74

Remote networking shows gains

Barrage of products expected to promise cost-effectiveness

BY JOANIE M. WEXLER
CW STAFF

Product innovations for cost-effectively blending remote branch sites into corporate networks continue to spiral with announcements from the likes of Micom Communications Corp., frame relay start-up Cascade Communications, Inc. and Ascom Timeplex, Inc.

Expected next week, for example, is the birth of a bridge-like device from Micom, called NetRunner, that merges voice- and data-compression techniques with cell-based packet switching. Combining these bandwidth-conserving networking schemes is said to let users cram bridged Ethernet local-

area network traffic, IBM Systems Network Architecture and other data, voice and fax transmissions onto one low-speed leased line.

An alternative to T1

Priced at \$3,500 and up, Micom's NetRunner is targeted at sites that have decided against T1 lines in favor of 56K bit/sec. speeds and that will use the corporate backbone mainly for non-real-time file transfers and electronic mail, said Ken Guy, vice president of corporate strategy and business development at Simi Valley, Calif.-based Micom.

Currently, companies tend to bridge or route their LAN traffic over leased lines and pay separate toll charges for voice and

fax. Guy said he expects customers to recoup their NetRunner costs in one year in toll savings.

The Micom product's main application is "saving money" — particularly at international sites, said Peter Bernstein, vice president of research at Probe Research, Inc. in Cedar Knolls, N.J. He explained that communications facilities are at a premium outside the U.S., which is an incentive to lump more traffic onto fewer lines.

In other moves for networking far-flung sites, Cascade in Westford, Mass., and networking vendor Ascom Timeplex in Woodcliff Lake, N.J., announced wide-area feeder switches at new price points.

Cascade is the earliest vendor

to build a frame-relay switch from the ground up that allows users or carriers to create a dedicated frame-relay backbone. The firm said it has incorporated congestion-control schemes in its \$16,000 to \$42,000 product, dubbed the STDx, to measure throughput and service levels.

Remote-area switch

Cascade chairman Victoria A. Brown said the company is largely positioning its switch for public carriers wishing to extend their frame-relay service offerings from core backbone switches to remote areas. WiTel has been beta testing the STDx, and Chris Heckart, the carrier's marketing product manager for broadband services, said it has been "extremely pleased with its performance."

However, Heckart said WiTel is more excited to see its customers use the STDx to concen-

Continued on page 73

Network helps to focus giant eye on heavens

BY GARY H. ANTHERS
CW STAFF

KAMUELA, Hawaii — Last November, a chanter and a priest offered traditional Hawaiian blessings to the world's largest telescope, which was under construction at the summit of the dormant Mauna Kea volcano 13,600 feet above the Pacific.

Thanks to those blessings and a cornucopia of computer and networking technology, the W.M. Keck telescope — four times more powerful than the one at Palomar Observatory near San Diego — was completed four weeks ago and this month is expected to produce some of the most stunning vistas ever seen of the cosmos. This

huge, high-tech fusion of optical and computer wizardry is the first in a generation of telescopes that will revolutionize astronomy, scientists said.

Computer and communications technology has shaped every aspect of the \$94 million telescope, called "the Keck" by its designers and builders. The eight-story, 270-ton structure was made ultrarigid and vibration-free by computer modeling and analysis. The 10-meter, 14.4-ton mirror — actually 36 separate hexagonal mirrors fitted closely together — was designed and then ground to unprecedented accuracy under computer control. And, thanks to high-speed, high-quality data communications, astronomers



will not have to brave the thin, frigid air of Mauna Kea but can work below at observatory headquarters some 50 miles away.

According to Hilton Lewis, drive and control system supervisor at the W.M. Keck Observa-

- Keck**
Kamuela, Hawaii
- **Challenge:** To precisely position telescope's 10-meter wide mirror for viewing the skies.
 - **Technology:** Twelve Motorola microprocessors coordinate mirror movements. They are tied together and communicate with observatory headquarters on an Ethernet network and 1.5M bit/sec. data line.
 - **Results:** Mirrors are expected to be positioned to within one-millionth of an inch.

tory, "huge amounts of data" were processed to design the telescope's components. "The mirrors could not have been designed without computers," he said.

By contrast, Lewis said the 5-

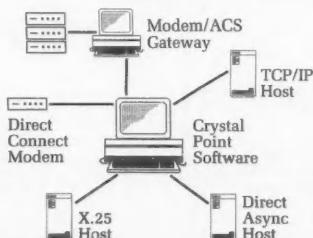
meter mirror in the Hale telescope at Mt. Palomar was designed in the 1940s using "slide rules and log tables." The mirror weighs 20 tons and took 11 years to grind, and for years astronomers assumed that the enormous mass of significantly larger mirrors would effectively bar their development.

But using sophisticated computer models, Keck scientists found they could combine 36 lightweight mirrors — with precise but complex curvatures — to build the equivalent of a single 10-meter mirror with four times the light-gathering ability of the Hale mirror.

Each of the 36 mirrors is fitted with sensors that send positional information to 12 Motorola, Inc. microprocessors communicating over a Transmission Control Protocol/Internet Protocol (TCP/IP) network. The computers coordinate the data, calculate adjustments and

Continued on page 75

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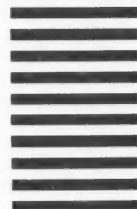
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Synoptics broadens SNMP choices

BY ELISABETH HORWITT
CW STAFF

SANTA CLARA, Calif. — A software package recently announced by Synoptics Communications, Inc. was designed to allow users to manage the vendor's intelligent local-area network hubs from a wide range of Simple Network Management Protocol (SNMP)-based network management platforms.

Lattis Views is said to manage Synoptics' LattisNet line of intelligent hubs on IBM's AIX NetView/6000, Digital Equipment Corp.'s DECmcc Management Station for Ultrix or Hewlett-Packard Co.'s OpenView Net-

work Node Manager. All three of these systems use SNMP as the basis for managing a broad range of LAN hubs, routers and bridges.

Lattis Views implements on these platforms many of the same capabilities that are available on Synoptics' original net-

work management platform, which is based on Sun Microsystems, Inc.'s SunNet Manager. The software is said to perform the following management functions for Token Ring and Ethernet connections:

- Call up fault, performance and configuration data on a concen-

trator, module or port level.

- Break out percentages of good and bad packets.
- Identify network resources for asset management and network planning.
- Isolate Token Ring or Ethernet segments for fault diagnostics.
- Establish security levels on the network.
- Review Token Ring station

profiles, determine station status or remove any station from the ring.

- Set thresholds that, if exceeded, automatically set off alarms.

The above functions can be called up via pull-down menus on the network management station map, Synoptics said. The package is scheduled to ship in July and is priced at \$6,995 for a single user license.

Products help remote nets

CONTINUED FROM PAGE 71

trate multiple networks onto one interface to its WilPak frame-relay service than for use within the WilTel network. This is because WilTel is already using feeder switches from another vendor, she said.

Brown added that the STDx will eventually include an interface into standards-based Asynchronous Transfer Mode (ATM) cell-relay networks. However, she emphasized that Cascade intends to remain in the frame-relay business and has no plans to become an ATM vendor.

One analyst noted that Cascade's product does not address the installed T1 multiplexer base. "Users will have to plunk the STDx right next to existing multiplexers they'll still need for voice traffic," said Doug Gold, director of communications research at International Data Corp. in Framingham, Mass.

On the Ascom Timeplex front, the company's \$5,200-and-up entreeLink+ feeder multiplexer, slated to ship in July, supports up to 44 ports at speeds up to T1. Compatible with and manageable by Ascom Timeplex's Link multiplexer line, the device is aimed primarily at the vendor's current users who are looking to extend their networks to smaller sites.

Automatic Data Processing, Inc. in Roseland, N.J., is using the product for that purpose. However, director of communications Ken Breault said that when his firm first needed a low-cost feeder multiplexer, Ascom Timeplex did not have an offering, so he went with another vendor.

That product did not integrate well with his management scheme, he said, so he moved to entreeLink+. Economics preclude him from replacing the other vendor's units.

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Pathworks lures users

CONTINUED FROM PAGE 71

existing NetWare installations. However, several information systems managers voiced concerns about whether the promised benefits would outweigh the added cost and overhead of installing yet another client/server package on their LANs.

Inco Ltd. is interested in using Pathworks to provide security features and possibly electronic-mail services, which NetWare currently lacks, according to Jim Bucher, superintendent of computer services at the mining and manufacturing company's Manitoba division.

For example, Pathworks' disk services enable a network administrator to automatically set a maximum number of users who can access a package such as Microsoft Corp.'s Windows 3.0 via the LAN, Bucher said. NetWare lacks this capability, he added.

In addition, Inco would like to provide its NetWare servers with the same level of file and record security that DEC VMS systems provide. A DEC salesperson indicated that DEC's upcoming NetWare for Pathworks product will provide NetWare with VMS-level security.

In addition, Pathworks could potentially play a key role in the E-mail network that Inco hopes to choose by the fall, Bucher said. The company is looking seriously at making the network compatible with the CCITT X.400 standard, and it is eyeing DEC products as potential tie-ins between the X.400 services and Novell LANs, he added. However, Bucher said, he first wants to see how DEC accomplishes this with the upcoming Pathworks for NetWare.

Several users cited DEC's superior wide-area networking capabilities as a major reason for adding Pathworks to their LAN systems. One network manager said he would much rather use DECnet than Novell's IPX as the

ticular interest to Glaxo, he said.

Darden Graduate School in Charlottesville, N.C., is thinking of buying Pathworks as a way to integrate its NetWare LANs with three VAX/VMS hosts, according to Andrew Boynton. Boynton, who teaches IS at Darden, also serves on a committee to evaluate upgrades to the school's networking and system capabilities.

"We want our graduate students to be able to dial into the system from remote locations, and you can't do it very well with Novell," Boynton said. Dialing into a VAX is comparatively easy, he added.

However, Boynton and several other users expressed concern about the price they would have to pay per personal computer for Pathworks in terms of software costs, overhead and administrative hassle. "Users feel that

NetWare is much easier to install and manage than Pathworks," Bucher said.

In addition, a new licensing convention that DEC recently announced requires each Pathworks user to be licensed at the workstation level, Bucher said.

"Right now, a network administrator can make up one set of Pathworks on a disk and carry it from workstation to workstation," he said. In contrast, the new convention forces the administrator to "crack open 30 packages in plastic seal."

In general, however, Bucher said he was impressed with the latest version of Pathworks, particularly its ability to bring up VAX applications via DECwindows and PC-resident programs via Windows 3.0 on the same screen.

Pathworks pros and cons

Users look to DEC Pathworks to solve long-standing LAN problems, but it has its limits

Useful features

- Record-level security.
- Controlled user access to LAN-based applications.
- Remote dial-in to LAN server.
- Wide-area network internetworking via DECnet or TCP/IP.

Drawbacks and limitations

- New per-workstation licensing convention makes it a chore to configure each client system.
- Additional cost, overhead per PC can be prohibitive.
- Users still have to log on and off to move between Pathworks and NetWare services.

CW Chart: Michael Siggins

routing protocol between geographically dispersed Novell LANs. A DEC representative assured him that DEC servers can now encapsulate IPX transmissions so that they can be routed over DECnet.

Glaxo Holdings PLC originally acquired Pathworks as a way to "integrate PCs with each other and with VAXs," said Jon Stanley, an IS manager at the London-based international pharmaceutical firm. Now Glaxo is looking at Pathworks as a way for users to exchange X.400-compatible E-mail and to track and exchange compound documents across a variety of systems enterprisewide, Stanley said. DEC's recently announced Team Links for Pathworks, which provides these services for Windows 3.0 users, is of par-

Cabletron hubs relieve bandwidth clutter

BY JOANIE M. WEXLER
CW STAFF

ROCHESTER, N.H. — To prevent network bandwidth from getting gobbled up by management traffic in centrally managed configurations, Cabletron Systems, Inc. last week distributed some functions of its high-level Spectrum network management system down to its intelligent wiring centers.

Software for Cabletron's Intel Corp. 1960-based hubs allows the hubs to poll local-area network devices locally and pass only "exception" information across the network to a central manager, explained David Culler, Cabletron's Ethernet products manager.

The "exception" information constitutes alarms or other indicators that notify users when conditions on a given sub-network are outside user-defined thresholds, he said.

This scheme precludes volumes of management information indicating healthy LAN conditions from cluttering up the network and decreasing overall network performance, Culler said. He added that the software, dubbed Distributed LAN Monitor (DLM), will work with Spectrum or any other centralized, high-level network manager based on the Simple Network Management Protocol (SNMP).

Reducing SNMP traffic

"Currently, SNMP traffic is one of the largest traffic pipes in our network," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co., a Cabletron shop in Newark, Del. He said his firm is currently regionalizing its network into four major hub sites interconnected by multiple T1 lines.

"We're looking to reduce the amount of SNMP internet traffic

coming back to the data center and get more into a 'management by exception' scenario," he said. Scoggin said he also hopes to reduce the load on his central Sun Microsystems, Inc. SPARCstation management station, "which is practically load-

SOFTWARE FOR CABLETRON'S Intel Corp. 1960-based hubs allows the hubs to poll local-area network devices locally.

ed," by distributing his management functions.

"As network size grows, especially in the TCP/IP world, the overhead associated with management traffic increases and can be a substantial issue to users," said Kevin O'Neill, vice president of research and consulting at Business Research Group, a consultancy in Newton, Mass.

O'Neill said that based on his firm's research last year of 400 corporate network managers, users seem to want a hybrid distributed/centralized management scheme.

"Companies are looking to perform routine functions locally, while they would like to concentrate high-level troubleshooting functions at a central site," O'Neill said.

Cabletron's \$495 DLM software, available now, can be implemented on the \$7,995 management module of Cabletron's high-end Multi Media Access Center. It also comes as a \$495 option to the vendor's MRXI-24, a \$3,995, 24-port, 10Base-T intelligent wiring center also announced last week.

Ameritech tests ISDN in telecommuting pilot program for customer service reps

BY ELLIS BOOKER
CW STAFF

CHICAGO — Remember when telephone companies pitched Integrated Services Digital Network (ISDN) as an ideal solution for telecommuting?

Recently, one phone company decided to put this concept to the test in its own business.

Late last month, Chicago-based Ameritech Corp. said it would deploy ISDN lines and special software to a handful of work-at-home customer service

representatives as part of a year-long trial. Ameritech — the parent of Bell companies in Illinois, Indiana, Michigan, Ohio and Wisconsin — will use an ISDN-based software package called PhoneServer from Unifi Communications Corp. in Billerica, Mass.

No call distributors

The PhoneServer software and ISDN combination eliminates the need for expensive, hardware-based call distributors, which are needed to route calls

to particular numbers.

"We can route calls directly to specific workers in the field by tapping into the signaling channel of the ISDN line — essentially using it as a network control mechanism," said Jeff Spotts, Unifi's director of product marketing.

As an incoming call arrives at one of Ameritech's ISDN-capable central office switches, it is directed to a Unifi "phone server," a Unix-based controller that transfers the call to other numbers. Calls can be routed accord-

ing to information conveyed on the ISDN signaling channel, such as automatic number identification and dialed number identification service.

The remote customer service locations attach to Ameritech's public phone network over a dig-



ital Basic Rate Interface (BRI) ISDN line. Each BRI provides two 64K bit/sec. channels for data or voice traffic and a 16K bit/sec. signaling and packet data channel.

Beyond the client portion of the PhoneServer software in-

stalled on their home personal computers, the field employees also need a BRI interface card to attach to the ISDN network. Unifi offers its own ISDN-ready phone set designed for customer support desks.

Ameritech is already testing PhoneServer with 10 service representatives at regular business locations; shortly it will add another 10 employees working at home to the trial.

An Ameritech spokesman said the company will decide at the end of the year whether to add the ISDN-based work-at-home solution to its customer service operation. Ameritech may also market the PhoneServer/ISDN application to outside customers, the spokesman said.

Syncordia to carry Big Blue traffic in Europe

BY ELISABETH HORWITT
CW STAFF

Syncordia, Inc. has become a network service provider's service provider, landing a contract to supply network backbone services for IBM's Information Network in Europe. This is the second announced contract for Syncordia, British Telecommunications PLC's global network outsourcing subsidiary.

The three-year contract is valued at more than \$10 million a year, according to Syncordia spokesman Jack Baird.

The British Telecom subsidiary will

support between 5% and 10% of IBM's European traffic, IBM spokesman Arthur Hill said. Traffic will be generated by both internal IBM users and customers of Information Network, IBM's international value-added network service he added.

The major motivation for IBM's move is the cost savings it expects to realize by using Syncordia's pay-per-usage virtual network instead of leased lines from various European Postal Telephone and Telegraph authorities, Hill said.

If this initial arrangement works out, IBM will consider turning over more of its international network to Syncordia, Hill

said. IBM is in the process of restructuring its entire worldwide network, he added.

Contract provisions

The contract also calls for Syncordia to provide IBM with the following:

- Single-source billing in European currency units.
- On-demand bandwidth for applications such as videoconferencing or bulk data transfer, with 24 hours' notice.
- Network availability benchmark and error rate reports.
- Guaranteed levels of service availability

or performance, with financial penalties when levels are not met.

Syncordia's other announced customer is European airline reservation consortium Amadeus. Syncordia has a third contract with an unnamed European bank and expects to announce another customer shortly, Baird said.

Syncordia's Concert network management platform will manage the physical portion of the network, while IBM will use NetView to manage the logical side, Baird said. The two companies are in the process of providing a commercial interface between their respective systems.

Net helps focus eye on heavens

CONTINUED FROM PAGE 71

send commands to motors that twice each second nudge the 6-ft, 880-pound mirrors into viewing positions accurate to a millionth of an inch.

The telescope's aim is also directed by Motorola, Inc. microprocessors, and its instruments, when installed, will be controlled by Sun Microsystems, Inc. Scalable Processor Architecture processors, all connected by TCP/IP over Ethernet. Users will interface to those computers via a MicroVAX running Digital Equipment Corp.'s version of Motif with the X Window System.

According to Lewis, the Keck telescope is the first to tie everything together with an Ethernet network rather than simply using point-to-point connections.

Mammoth data collection

As one might expect, a 10-meter mirror captures a lot of data. The Keck will make some 10 to 20 observations per night, each with 32M bytes of information. The data will be written to magnetic disks at the telescope and transmitted continuously to optical disc archival storage at Keck headquarters here.

The headquarters is connected to the mountaintop via a 1.5M bit/sec. line, over which Lewis and his staff of 15 programmers and analysts can send software changes.

Lewis said bandwidth will have to be boosted when the telescope goes into full production, possibly to several 6.3M bit/sec. lines. A satellite link may also be established to campuses of the University of California and the California Institute of Technology, which built and now operate the telescope.

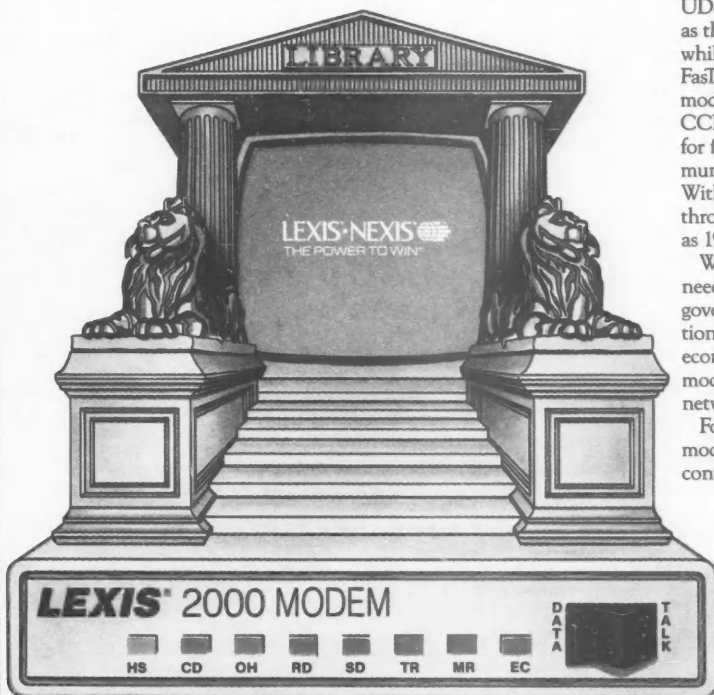
Eventually, Keck scientists hope to use advanced techniques called adaptive optics to sharpen the telescope's focus. While the Keck's mirror gathers 17 times more light than the mirror in the space-based Hubble telescope, it must contend with some blurring produced by the atmosphere. Scientists are experimenting with neural networks — specialized computers that mimic the nervous system — to remove some of that distortion.

That kind of image processing could substantially improve the Keck's focus, said Peter Wizinowich, optics manager for the telescope. "The advantage of the Hubble is dwindling as these techniques improve," he said.

Datacomm Commentary

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*Bob Kantor
Ciba-Geigy Corporation*

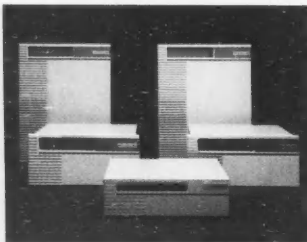
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NEW PRODUCTS

Modems

U.S. Robotics, Inc. has cut the prices of its WorldPort portable fax/modems and Sportster modems.

The cost of the WorldPort 2496 Fax/Data device is now \$379, reduced from \$499. Other prices are as follows: WorldPort 9600, \$559; Sportster 9600 external model, \$549; and Sportster 9600/PC internal model, \$495.

U.S. Robotics
8100 N. McCormick Blvd.
Skokie, Ill. 60076
(708) 982-5010

Micro-to-host

InterConnections, Inc. has added File Sharing Services to its Leverage for NetWare product line.

File Sharing Services allows Novell, Inc. NetWare users to store files on any Digital Equipment Corp. VAX/VMS system and print NetWare-generated output on VMS printers.

The product is an upgraded version of NetWare for VMS, developed by InterConnections and previously marketed by Novell.

Pricing ranges from \$1,500 to \$13,000.

InterConnections
14711 N.E. 29th Place
Bellevue, Wash. 98007
(206) 881-5773

Customer-premises equipment

Telematics International, Inc. has announced new lower priced models in its Telematics Net25 Programmable Communications Processor product line.

The S4501 has 8M bytes of random-access memory and is priced at \$29,950. It can support three processors, as much as 16M bytes of memory, 480 ports and 2.048M bit/sec. line speed.

The S5501 provides 16M bytes of memory and support for five processors. It is priced at \$52,500.

Telematics
1201 Cypress Creek Road
Fort Lauderdale, Fla. 33309
(305) 772-3070

Links

Laser Communications, Inc. has introduced a laser transmission device for linking extended Token Ring local-area networks.

The Lace L00-50 system connects LANs at distances of up to 1 kilometer at 4M/16M bit/sec. channel speeds. It is protocol-independent and does not require special licensing, the company said.

A complete system costs \$23,200.

Laser Communications
Suite F
1848 Charter Lane
Lancaster, Pa. 17601
(717) 394-8634

Gateways, bridges, routers

Raycom Systems, Inc. has designed a Source Routing Transparent bridge for Token Ring networks.

The Model 3440SRT Local Token Ring Bridge automatically routes both

source-routed and transparent traffic on heterogenous local-area networks.

In transparent routing mode, the bridge filters data at 153,600 packet/sec. It can incorporate an integrated fiber-optic interface for connectivity to fiber backbones.

The standard model costs \$5,200; with the fiber-optic extender, the price is \$5,800.

Raycom
#C-8, 16525 Sherman Way
Van Nuys, Calif. 91406
(818) 909-4186

Rabbit Software Corp. has announced the 1.0 Open Advantage APPC Server for

DOS. The Advanced Program-to-Program Communications server allows users to develop distributed applications on an IBM Systems Network Architecture network.

It is offered as an option on Rabbit Software's Open Advantage gateway and can coexist with 3270 emulation, which allows users to develop applications while continuing to run their existing main-frame communications.

Rabbit Software
Great Valley Corporate Center
7 Great Valley Pkwy. E.
Malvern, Pa. 19355
(215) 647-0440

SynOptics Communications, Inc. has introduced a router that integrates Apple

Computer, Inc. Macintosh systems and peripherals into enterprise networks.

The LattisTalk Model 3394 combines multiprotocol router capability with PhoneNet technology from Farallon Computing, Inc.

It allows Unix servers to exchange data with the Macintosh and provides multiport repeater functionality with routing for LocalTalk and EtherTalk network data.

The router can be managed through Simple Network Management Protocol extensions.

Pricing is set at \$3,595.
SynOptics Communications
4401 Great American Pkwy.
Santa Clara, Calif. 95052
(408) 988-2400

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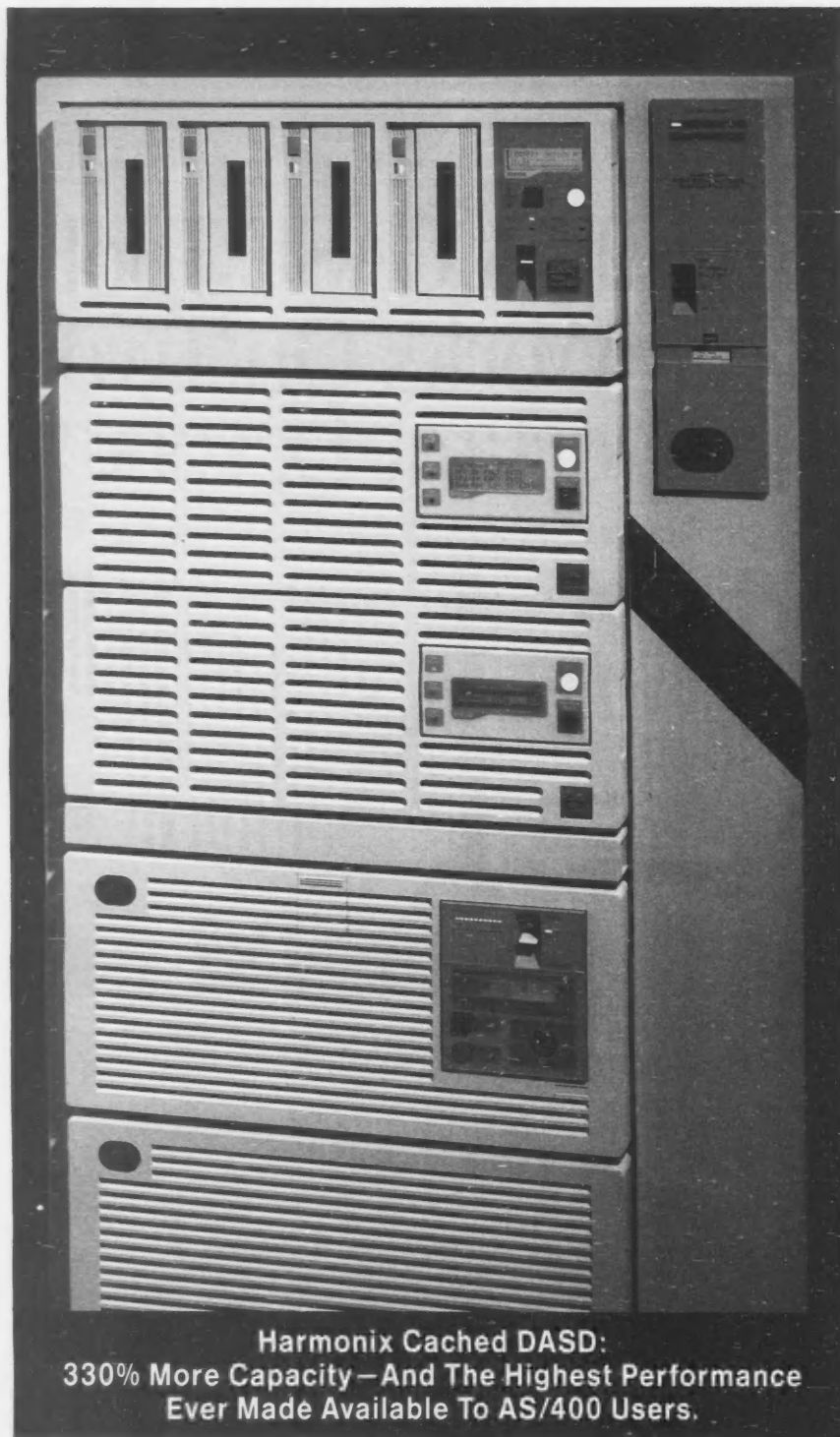
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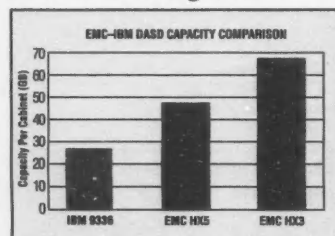
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For a technical summary of EMC's ICDA technology and more information on Harmonix, call 1-800-222-EMC2 ext. M238A.

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LARGE SYSTEMS

HARDWARE • SOFTWARE • STRATEGIES

Memorex reveals disk, tape strategies

Automated tape library extended in anticipation of IBM, Storage Tek intros

BY JEAN S. BOZMAN
CW STAFF

In a broad-ranging package of announcements, Memorex Telex Corp. recently introduced products that will extend its Memorex 5400 automated tape library to smaller environments. The firm, based in Dallas and Milpitas, Calif., also laid out an outline for its disk and tape product strategies.

About 300 units of the original Memorex 5400 tape library, built with Fujitsu Ltd. tape drive components, have been sold worldwide, which is far less than competitor Storage Technology Corp.'s installed base of 3,900 automated libraries.

Memorex Telex executives said they hope to increase sales in the coming year by offering more choices to users of large-scale and midrange systems.

Memorex Telex's announcement — which ranged from downsized tape library systems to redundant arrays of inexpensive disk drives — was intended as a statement of direction for information systems planners.

Chief among the new products is the \$144,000 Memorex Telex 5100, a downsized library that contains 315 cartridges instead of the full library's 5,000 cartridges. The Memorex 5100 can fit inside a doorway, whereas a 5400 tape library, priced at \$800,000, is nearly 50 feet long.

With the 5400 tape library, users can "grow" their base-level storage systems through upgrades.

Memorex Telex also announced compatibility with IBM's midrange Application System/400s and a partnership with Interlink Computer Sci-

ences, Inc. in Fremont, Calif., to connect the Memorex libraries to Digital Equipment Corp. VAX computers. The firm also announced the Memorex 5450, a \$59,000 rack-mounted cartridge-tape subsystem compatible with IBM 3480 and 3490 cartridge-tape systems.

The Memorex Telex news came only weeks before IBM's expected introduction of its first automated library product and before Storage Tek details its downsized tape libraries for

1993 and 1994. Industry analysts said Storage Tek dominates the automated tape library market with a market share of more than 90%.

Countering competition

Industry analysts also said they are unsure whether \$1.7 billion Memorex Telex can dent Storage Tek's lead in automated libraries and counter IBM's sales influence in large IBM shops. However, the new marketing plan allows Memorex Telex to act as a systems integrator, reducing overhead costs.

"They don't have a cash cow like Storage Tek's tape library,"

explained Stan Corker, a senior storage analyst at International Data Corp. in Framingham, Mass. "They're compensating for a lack of development money by having alliances with software companies."

Memorex Telex announced two new business partners for automation software: Systems Center, Inc. in Reston, Va., for IBM's VM operating system software and Goal Systems International, Inc. in Columbus, Ohio, for VM and MVS systems. Software will be the differentiating factor in the next generation of tape libraries, analysts said.

"Our Library Management

System software deals with the management of all off-line media, whether it is in the library or out," said Nick Tuttle, director of storage systems marketing at Memorex Telex.

Arizona State University in Phoenix uses its 2-year-old Memorex 5400 tape library to store just 10% of the university's 35,000 tape cartridges. However, any library tape can be accessed in 40 seconds. The Arizona library is connected to two IBM mainframes running MVS. "Originally, all we had was IBM 3420 round reels of tape," said Bob Nelson, operations manager at Arizona State's information resources management department. "We went to cartridge drives next, and then we evolved into the robotic system."

Unix system on deck for Louisville Slugger firm

BY KIM S. NASH
CW STAFF

LOUISVILLE, Ky. — By the time you flex and bend through the last seventh inning stretch in October, Hillerich & Bradsby

Co. will have cut down, chopped up, honed and polished 40,000 trees into about 1.5 million Louisville Slugger baseball bats.

The 108-year-old company, which supplies the lion's share of professional wood swung during that venerable American game, relies on tradition to get the job done — namely, systems from Unisys Corp., Hillerich & Bradsby's vendor for 25 years.

But just as baseball has gone to artificial turf and domed stadiums, Hillerich & Bradsby is going nontraditional, planning to switch from a proprietary computer to a Unix-based system.

A Unisys System 80 Model 20 mainframe plays center field among 244 terminals and personal computers at eight sites throughout the country. The big box cranks through 10 major applications, including electronic data interchange with a dozen major customers, order schedul-



Michael Wilson

Hillerich & Bradsby is planning to ultimately 'bench' the mainframe and replace it with a Unix-based system, according to Grubbs

ing, product routing, time and attendance and other administrative tasks.

Although February's upgrade from a Unisys Model 10 main-

frame to a Model 20 reduced daily processing by eight hours, the new mainframe may be benched, said Ronald "Larry" Grubbs,

Continued on page 84

ON SITE

Hillerich & Bradsby Co.
Louisville, Ky.

• **Challenge:** Track baseball bat and golf club orders, production and delivery.

• **Technology:** Unisys mainframe and bar-coding system.

• **Results:** Product tracking system now integrated with EDI systems of several major customers, including Wal-Mart Stores, which speeds delivery and cuts down on errors.

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Everyone agrees they're

No one's debating whether open systems are a good idea, but you'll hear plenty of discussion about what open systems *are*.

Some insist, for example, that an open system is a UNIX® system. But to others it's whatever it takes to get their different operating systems, networking protocols and databases working as one, and the sooner the better.

That's why IBM views open systems so openly. To us, they begin less with particular technologies and more with the needs of your business.

The real goal is to liberate information that's trapped around your company, so more of your people can use it more easily, and to open commu-



good, but not everyone agrees how to get there.

nications with customers and suppliers, who no doubt planned their systems without thinking about yours.

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So the paths to open systems will vary, but there's one thing that won't—consistent industry standards. IBM is fully committed to open systems, so we're equally fervent about standards.

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holds promise, we support its development.

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At IBM, we now measure everything we do—from the desktop on up—against a yardstick of openness. It's what we have to do because it's what you want to do. To get more information, call us at 1 800 IBM-CALL.



Unix system on deck for Louisville Slugger maker

CONTINUED FROM PAGE 81

data processing manager for the \$66 million firm.

"It's been good to us — all our Unisys systems have — but it runs on old-timer technology. [The OS3] operating system won't be around forever," Grubbs said.

Unisys announced Open/80 last year, which is a strategy to move proprietary OS3 users to Unix platforms. "It seemed to me that Unisys was saying OS3 was nearing the end. They told us it's not, but still they want to help us to move to Unix. So we will," Grubbs said.

Grubbs is currently mapping out a plan

to bring up a Unisys-supplied server based on The Santa Cruz Operation's SCO Unix. A Unisys imaging system that will be integrated with the Unix setup has already been installed in the records storage department.

In the year since that move, Grubbs said, "Imaging sure cleaned up the place."

Quicker calls

He said he could not estimate time or money saved but noted that customer service clerks are now able to handle questions and complaints more quickly.

"If Kmart or Wal-Mart calls up and wants a record of orders for the last three years, you got everything right there, instantly," Grubbs said.

Hillerich & Bradsby moves a lot of product, especially during its two busy seasons: pre-Christmas and pre-Opening Day. The guys in the big leagues alone each use an average of 72 bats per season, but Hillerich & Bradsby supplies — in addition to wooden bats — 100 models of aluminum bats to colleges, high schools, retailers and corporate teams.

The 600-employee company focuses only on sports gear. It also makes mitts,

hockey sticks, pool tables and PowerBilt golf clubs.

An extensive bar-coding system running from order entry to the loading dock courses through Hillerich & Bradsby's eight sites and keeps tabs on orders built, filled and shipped. It is the biggest application that Grubbs and his 12-member staff run.

Incoming orders are recorded on forms sporting a bar code in the upper righthand corner. Clerks first input the order onto the mainframe, then scan in the bar code. Then, a sticker showing the bar code and condensed order data is printed.

Workers scan the terminal screens and select jobs to do based on when the order must be shipped. Once a job is started — say, the manufacture of a dozen 33½-in., 30-ounce bats for the Atlanta Braves'

This printer will still be productive when Michael becomes computer manager.



Facit's new volume printer, the Facit E950, is designed for really demanding applications. It handles round-the-clock operations at 320 lines per minute and features Facit's new FlexForce print head which can produce over 1,500,000,000 characters (that's 1.5 billion!) with no reduction in print quality.

The 8-part form handling is characterized by excellent print quality on all copies. Furthermore, the E950 provides advanced paper handling including on-demand forms delivery.

And, unlike other printers, this one is so easy to use, it's child's play. All functions are controlled via just two keys and an easy-to-read LCD display.

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FACIT

Tough Printers for Tough Applications

EACH MAJOR LEAGUE player uses an average of 72 bats per season, but Hillerich & Bradsby supplies — in addition to wooden bats — 100 models of aluminum bats to colleges, high schools, retailers and corporate teams.

Otis Nixon — the worker attaches the appropriate sticker to the bats-in-progress and passes them to the person at the next station.

Finally, when Nixon's order is done, shipping clerks scan the bar code to retrieve a mailing label showing Nixon's address and all pertinent order information. Then the bats are boxed and sent on their way to Braves Stadium in Atlanta.

Finicky customers

The task is complicated when you consider that many professional players request special touches such as hand-turned rather than machine-molded bats. The boys of summer produce 20,000 specification files listing which big leaguer prefers which features on the 300 different models of Louisville Slugger bats available.

Grubbs will ultimately integrate the new Unix configuration with the bar coding, imaging and other custom-made mainframe applications, most of which were built by programming manager Don James. He and Grubbs said they will probably rely on in-house talent and help from Unisys to do the migration instead of opting for a third-party firm.

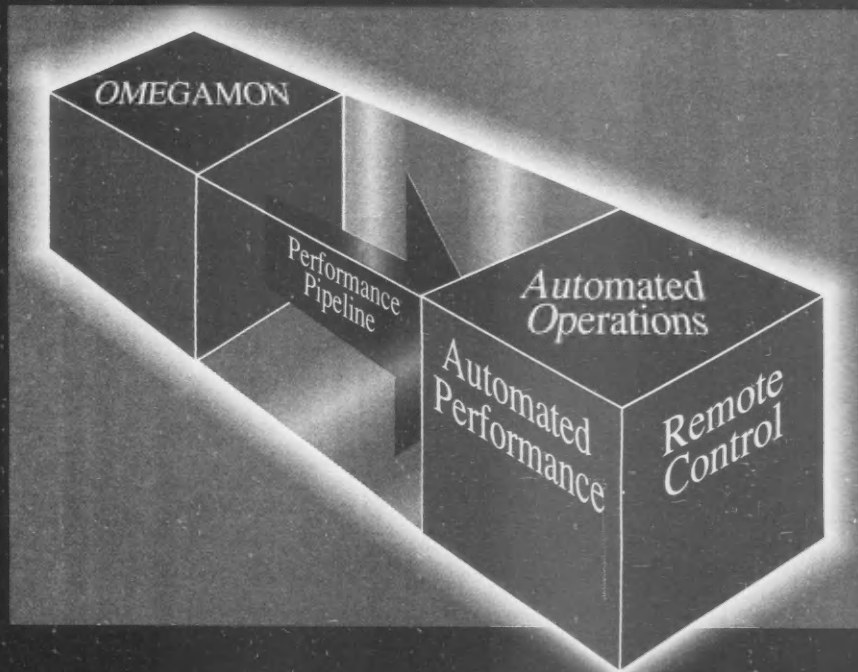
"We've been writing our own stuff since 1971. The stuff we manufacture and the way we do it are unique; so is our software," James said.

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DEC turns to service in utility sector

BY THOMAS HOFFMAN
CW STAFF

BOSTON — Having suffered major operating losses in its last two quarters — most recently the \$294 million hit for the third fiscal quarter — Digital Equipment Corp. is trying to leverage more sales revenue from its fastest growing vertical industry customer bases.

When the doors opened at DECworld '92 here recently, one of the first vertical industries for which DEC introduced new offerings was the utilities market. This market generates \$500 million in reve-

nue for DEC annually and is growing by 26% per year, according to Bill Johnson, vice president of corporate marketing at DEC. Still, the firm has its hands full trying to win over potential customers where it has failed before.

"We've invited DEC into our shop a number of times to see if they could improve our operations, but they've always come up short," said Bud Collins, vice president of information systems at Boston Gas Co. in Boston.

DEC's latest program is Digital's Utility Network Integration Technology (DECUnity). The program is a utility-

cused framework aimed at providing systems and application integration for utilities to unify their multivendor computing environments through computer and utility industry standards. Standards supported include Posix, Open Systems Interconnect, Utilities Communications Architecture and Database Access Integration Services, a standard that the Electric Power Research Institute (EPRI) plans to make available later this year. EPRI is a Palo Alto, Calif.-based research consortium whose members include most of the major utilities in the U.S. and Europe.

Each of these standards fall under DEC's Network Application Support networking architecture.

Base products under the new program include Microsoft Corp.'s MS-DOS and the expected Windows New Technology operating system, IBM's OS/2, Apple Computer, Inc.'s Macintosh systems, the Open Software Foundation's OSF/1 and DEC's Ultrix and VAX/VMS platforms. Services include management, applications and technical consulting.

Strategic integration

EPRI executives said the utilities industry needs integration programs such as DECUnity to integrate disparate computing platforms. "We believe this is a strategic announcement by DEC, not only through its products and services but also through its partnerships in the industry," said Wade Malcolm, program manager at EPRI.

Even though DEC has more than 1,000 customers in the utilities market, including Tokyo Electric Power Co., British Gas PLC, Pennsylvania Power & Light Co. and Detroit Edison Co., the company will have to work hard to win some new accounts.

Not all of DEC's utility customers see a real need for the multivendor integration services.

"We use DEC SNA gateways to link our IBM 3090 mainframe with our DEC VAX 9210 and VAX 6510 machines, so I don't think we really see a need for these services," said Richard Marx, director of information services at Commonwealth Electric Co., the Wareham, Mass.-based utility that powers southeastern Massachusetts.

Tom Batiste, senior consultant at CSC Partners, a Waltham, Mass., consulting firm, said he believes the new program could help DEC leverage more sales. The utilities industry "is a very IT-driven business, but historically it hasn't been a very well integrated IT environment," Batiste said.

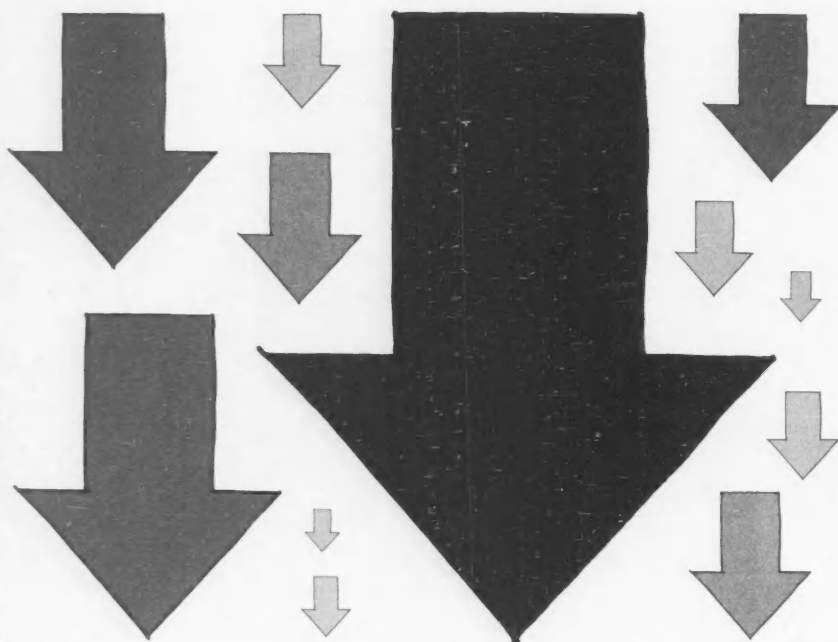
IN BRIEF

Sequoia expands system support

■ Sequoia Systems, Inc. recently announced a support network designed to detect system errors at customer sites throughout the world. Sequoia Support Network reportedly monitors performance of Sequoia fault-tolerant systems on a continuous basis, allowing support personnel to take active steps to prevent system failures.

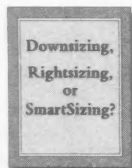
A Sequoia system running the Sequoia Automatic Fault Evaluation (SAFE) software at the company's Marlboro, Mass., headquarters analyzes fault reports fed to it from customer sites via a worldwide X.25 network. SAFE then initiates diagnostic procedures and notifies support personnel.

■ Siemens/Nixdorf Information Systems, Inc. last week announced that it is entering the U.S. supermarket IS business. The company, which claims to have systems installed at 17 of the top 20 supermarket firms in Europe, will be promoting its POSITION point-of-sale terminals, in-store processors and applications throughout the U.S. market.



What's the down size?

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Legent, Landmark to share technology

BY GARY H. ANTHERS
CW STAFF

VIENNA, Va.— Legent Corp. and Landmark Systems Corp. recently announced an agreement by which they will offer users an integrated, consistent look into combinations of their mainframe products.

Legent has licensed Landmark's workstation-based tool, NaviGraph, for downloading, displaying and analyzing the output of mainframe performance monitors. Legent will use the product to provide a common, graphical user interface to its mainframe products and to combine and manipulate the output from multiple Legent and Landmark products on one screen.

LTV Steel Corp., a major user of products from both companies, has agreed to be a beta-test site for the new Legent version of NaviGraph. James Guist, manager of network and computer operations, said, "It's something we've been trying to do for the past 10 years — to view multiple results without going to multiple screens and to do it in a consistent way."

NaviGraph comes in two linked components: one running as a file server on the mainframe and one running as a Microsoft Corp. Windows application on one

or more IBM Personal Computers. The mainframe piece downloads performance data from CICS/MVS, CICS/VSE, MVS, DB2 and VTAM environments and soon from Legent storage management and network performance products. The PC component can graphically display data from each of the mainframe-based monitors, allowing users to see the performance of the whole machine at once.

Legent's first implementation of NaviGraph is expected in the first quarter of next year. One version will allow users to combine, display and analyze the output from Legent's Astex, MICS StorageMate

and DASD Space/Storage Manager products for managing disk storage. A second will provide an integrated view into NetSpy, LANSpy, MICS SNA Analyzer and MICS Network Service Reporter products for network performance management.

As another part of their strategic agreement, Legent and Landmark said they will create various application packages that integrate Landmark's TMON family of performance monitors with Legent's AutoMate data center automation products.

"For users, if they have both Legent

and Landmark products, this gives them a little more assurance that their products will work together," said Fred Joy, senior research analyst at Meta Group, Inc. in Stamford, Conn.

Joy said the agreement adds to Landmark's stature and puts it in a major systems management product camp allied with Legent and Goal Systems International, Inc., which Legent just acquired [CW, April 6], against IBM and Computer Associates International, Inc.

Both companies will sell the workstation component of NaviGraph for approximately \$1,000 per copy. Legent's mainframe interfaces to NaviGraph — initially one for storage and one for network performance — will each sell for \$5,000 to \$15,000, depending on CPU size.

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NEW PRODUCTS

Turnkey systems

Kodak Electronic Printing Systems, Inc. has announced an upgrade to its Kodak Prophecy Color Production System.

Release 2.1 of the Prophecy system, which is built around Sun Microsystems, Inc. workstations, adds a Batch Tool feature, support for the Iris 4012 Inkjet Printing System, improved Swap Space memory requirements and a link to the Kodak PCS100 Image Station.

The Picture Stack Function and Log Job Files have also been enhanced, the company reported.

The complete Prophecy system, including a Sun workstation, costs \$89,500. A software upgrade to Version 2.1 costs \$2,500; Prophecy users under service contract will receive the upgrade free of charge.

Kodak Electronic Printing Systems
164 Lexington Road
Billerica, Mass. 01821
(508) 667-5550

I/O devices

Lexi Computer Systems Corp. has announced the availability of the Interimate 3270 kit, which lets mainframe users print on a Hewlett-Packard Co. LaserJet printer.

The product is installed in the HP printer's I/O slot; it connects to the mainframe via coaxial cable and to a personal computer or local-area network via serial or parallel cable. It supports all standard IBM features and emulations, according to the firm.

The product costs \$995.
Lexi Computer Systems
242 Neck Road
Ward Hill, Mass. 01845
(508) 521-1118

ES/9000: Faster — but tricky

Evaluations of the Model 900 reveal that IBM's largest mainframe is twice the speed of the 3090, but fiber-optic channels are difficult to implement

BY MICHAEL L.
SULLIVAN-TRAINOR
CW STAFF

When it comes to horsepower, IBM delivers. But Big Blue still has not made its new mainframe features any easier to operate, according to early users of the Enterprise System/9000 Model 900, IBM's latest largest mainframe.

Four users, members of *Computerworld's* Product Evaluation Council, conducted in-depth evaluations of the Model 900, which is in production at their sites. Their findings are reported below in New Product In-Site,

a monthly section of *Computerworld* starting today that features user evaluations of large systems hardware, software and communications products.

The Model 900 is a milestone product for IBM because it is the top of the line for the first generation of a new family of mainframes. The system provides logical partitioning, allowing the 900s to be used as footprint or data center consolidation machines. It includes Escon, a new fiber-optic-based channel architecture that allows users to link storage devices miles away from the processor and transmit data at double the speed of non-Escon systems.

User evaluations of these and other features reveal the following:

- User benchmarks rate the Model 900's performance as twice as fast as the 3090 Model 600J, running at 230 to 240 MIPS.
- Deep discounts were achieved by the companies interviewed, but the evaluators still expressed concerns about the system's overall price.
- Escon channels are expensive, and users are having difficulty implementing them.

The evaluators were selected from a list of more than 20 information sys-

tems organizations who make up the *Computerworld* Product Evaluation Council. Because of user company policy, the evaluators and companies are not identified by name. (See the list of council members and company profiles of the sites involved in this evaluation on the next page.)

Consultants from Technology Investment Strategies Corp. and Howard Rubin Associates developed the questionnaire and rating system each organization used to evaluate this month's product. Evaluators' findings were shared with each other and *Computerworld* in a teleconference prior to publication (see Methodology next page).

RELIABILITY

With time installed ranging from two months to six months at the user sites, the ES/9000 Model 900 has never failed in a way that impacted operations, according to the four evaluators.

Company 3, which started using the system last winter, had to replace one part but has not had a single hardware failure since then.

PERFORMANCE

Promised to perform at twice the capacity of the previous generation's top of the line (3090, 600J), the six-processor ES/9000 has exceeded their expectations, the evaluators said. One company received a promise from IBM that performance would increase to 272 MIPS. But Gartner Group, Inc. reported that no user has reported anything near that amount. Gartner Group rates the Model 900 at 235 MIPS.

Company 2 performed benchmarks to determine the capacity of the Model 900 to the 600J. It had expected the 900 to be about 1.76 times faster, or 210 MIPS. Instead, it achieved about 1.94 times the performance of the 600J, or about 232 MIPS, using the same work load for both systems. Company 2, which is in the transportation industry, has a work load that includes IMS on-line and batch applications,

with a very high volume process that handles more than 4.5 million transactions a day.

Company 3 found that the faster ES/9000 processors, coupled with the higher speed channels, collapsed batch application processing windows dramatically. Processing time for a large DB2 batch application was reduced from four hours to under two hours. TSO transaction response time, which is measured daily, improved by about 40%.

SUPPORT

IBM's level of service is usually highest for this class of product, and the Model 900 is no exception. Evaluators reported that most service problems are handled routinely by local support staff without significant delays or problems. The companies all reported very smooth installation processes and well-coordinated on-site efforts by their IBM support teams.

Companies reported that spare parts are stored on or near their locations to facilitate service and that the IBM technicians on site have experience in installation as well as maintenance.

PRICE

With a list price of \$22.8 million, you can't buy a more expensive mainframe from IBM. But most users are not paying that price because of IBM's desire to push the new line and replace the previous generation. Migration deals are offered for 3090 users who upgrade.

While all the users interviewed reported taking advantage of the migration option, they rated the price at or slightly above what they expected to pay. One company reported paying \$1 million less for the ES/9000 than for a competitor's system that offered the same capacity. The users also said they think the operating system should be priced separately.

Company 4 reported that setting up competitive bidding situations markedly helped them get better deals in the negotiations with IBM.

Company 3 liked the deal it received but found the fiber channels pricey. The fact that the MVS operating system is tied to the size of the machine is a sore spot.

On maintenance costs, James Cassell, a vice president at Gartner Group, reported that IBM has the users over a barrel.

"Maintenance pricing is not tied anywhere near to cost. There are less parts in a 900 than there are in a 3084, and yet the maintenance price is significantly higher. However, we are finding that as customers come off their CSA, when they bring in an alternative main-

USER REVIEWS

- Early users say IBM's ES/9000 Model 900 represents a quantum leap in performance but little else.
- The new system contributes no more than its 3090 predecessors to the automation of the data center.
- Sophisticated Escon channels are expensive and difficult to implement.
- Users achieve deep discounts over list price for their systems by exercising migration deals and competitive bidding.
- Twice the capacity of the 3090 Model 600J, the ES/9000 Model 900 is already nearing full utilization at major corporate sites.

tenance supplier, IBM is responding with some pretty significant discounts in order to sign them up," he said.

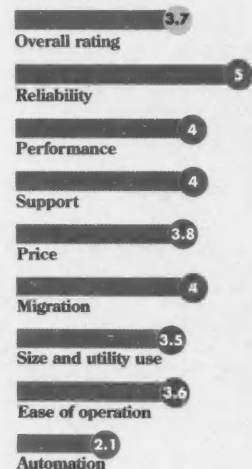
MIGRATION

Users reported that the installation and migration to the 900 was very smooth and very similar to implementing another 3090 class system, with the

NEW PRODUCT IN-SITE

IBM ES/9000 MODEL 900

SUMMARY OF EVALUATIONS



Ratings are evaluated on a scale of 1 to 5, where 5 is the highest. Ratings presented in order of importance to users.

IBM ES/9000 MODEL 900

IBM:	240 MIPS
Jim Cassell, Gartner Group:	234 MIPS
Company 1:	Expects at least 240 MIPS
Company 2:	232 MIPS
Company 3:	Reduced DB2 batch application run time from four to under two hours; 60% improvement in TSO transaction response time
Company 4:	Meets expectations
Comparison rating, 3090 Model 600J:	119 MIPS



major exception of the Escon channels, which are difficult to use because they require an adaptation of the current communications channels.

SIZE

Users found that the ES/9000 Model 900 uses about the same space as the 3090 Model 600J, but it allows twice the capacity and therefore consolidates data center space. The system required some reworking of the power supply, moving from 400Hz to 60Hz systems.

OPERATION

The evaluators found that the system did not make it any easier for their staffs to operate. The users are still struggling with the implementation of the Escon channels.

According to Cassell, users have found Escon very difficult and somewhat perplexing because they can't get more than 96 parallel channels on an ES/9000. This quantity does not allow sufficient benefit to move to a more costly environment.

- Company 4 reported that it is using the same number of staff members to operate the new system as it used for the previous version.
- Company 3 reported that the biggest challenge was making sure the staff understood all the implications surrounding fiber-optic equipment regarding short-term and long-term direction.
- When company 3 installed the 900, it installed Escon channels. However, it had to install converters to talk to the 3990 controllers because the features to upgrade the 3990 weren't available

IBM responds

Here is IBM's response to issues raised in the product evaluation:

Performance: IBM expresses performance of the ES/9000 Model 900 relative to the ES/3090 Model 600J and uses internal throughput as the metric. The metric is a measure of how much additional capacity, in terms of real work, the newer machine is capable of, and it varies by environment. The metric is in the range of 2.0 to 2.2 in a commercial environment.

Hardware prices: The price IBM offers to an individual customer is based on a number of items, including volume purchased, implementation of strategic architectures, special promotional offerings and joint studies or application development efforts. Trade-ins or migration offerings may also be available but are not considered discounts.

Software prices: Within the IBM ES/9000 family alone, the largest machine has more than 100 times the processing capacity of the smallest machine. A stand-alone, set price would result in a less equitable price-to-value relationship. While graduated charges remain the basis of IBM's price structure, we continue to look for ways to improve the software price-to-value relationship for our customers.

Escon: Many customers have already realized the benefits and value obtained from installing Escon, such as higher availability, better configuration management and the opportunity to locate I/O devices farther from the processor than is possible with parallel channels.

Automation: Our customers can meet many of their automated operations needs by using the latest releases of our ESA operating system and the more than 50 systems management products available from IBM and members of the International Alliance for System View.

Capacity: Above and beyond providing the largest single systems image in the industry, the Model 900 gives customers the option of establishing a Sysplex of up to eight systems capable of working in concert.

at that point.

• Company 4 is also using Escon, to get beyond the 400-ft distance limit of the prior channel connection.

• Company 2 is using Escon through only two converters. It has a major effort under way to determine how to implement them. The company reported that it will be a very difficult conversion.

AUTOMATION

Evaluators rated automation low because the new system does not significantly decrease the amount of functions the data center staff must perform. It is no more automated from a staffing standpoint than its predecessors.

• Company 1 reported that it has a large majority of its console operations automated. It is moving to a centralized command structure. The ES/9000 didn't detract from that, but it didn't improve it either.



- AT&T
- American Presidents Co.
- Bell Atlantic
- Bergen Brunswick Corp.
- Chase Manhattan
- Commonwealth Edison Co.
- Consolidated Freightways, Inc.
- Corestates Financial Corp.
- Dresser Industries Inc.
- Federal Express
- First National Bank of Chicago
- FMC Corp.
- Grumman Corp.
- K Mart Corp.
- Long Island Lighting
- Mass Mutual Insurance Co.
- MCI Corp.
- Mellon Bank
- Metropolitan Life
- Northeast Utilities
- Preston Trucking
- Primerica
- Public Service Electric and Gas
- Ryder System Inc.

METHODOLOGY

Product ratings and written information are based on the evaluations by four user organizations and a product analyst who have extensive knowledge of the product. Each user has a version of the product installed at their site running production workloads. The material was gathered through written surveys and teleconferencing. The users are members of the Computerworld Product Evaluation Council.



RATINGS

Reliability	5
Performance	5
Support	4
Price	4
Migration	5
Size	4
Operation	4
Automation	4
Overall	4.4

INDUSTRY: UTILITY

- Number of processors: 1
- Product installed: Early 1992
- Total support staff: 100
- Other processors: IBM 3090, 600J, Amdahl 5880, 500A
- Amount main memory: 512M bytes
- Amount expanded storage: 512M bytes
- Number of channels: 128
- Escon channels used: No
- Operating system: MVS
- Application: 60% on-line, 40% batch. Multi-application processing of production applications.



RATINGS

Reliability	5
Performance	4
Support	4
Price	3
Migration	4
Size	4
Operation	3
Automation	3
Overall	3.8

INDUSTRY: BANKING

- Number of processors: 1
- Product installed: Late 1991
- Total support staff: 80
- Other processors: IBM 3090, 600J
- Amount main memory: 1G byte
- Amount expanded storage: 1G byte
- Number of channels: 128
- Escon channels used: Yes (48)
- Operating system: ESA (latest level)
- Application: On-line IMS and TSO as well as DB2 batch applications. Very heavy on-line work load.



RATINGS

Reliability	5
Performance	5
Support	4
Price	5
Migration	5
Size	3
Operation	3
Automation	3
Overall	4.1

INDUSTRY: TRANSPORTATION

- Number of processors: 1
- Product installed: Late 1991
- Total support staff: 734
- Other processors: 5 IBM 3090s
- Amount main memory: 512M bytes
- Amount expanded storage: 512M bytes
- Number of channels: 128
- Escon channels used: Yes
- Operating system: MVS SP 4.1
- Application: IMS, non-IMS batch programs, IMS on-line programs. Very high volume (greater than 4.5 million transactions daily).



RATINGS

Reliability	5
Performance	3
Support	5
Price	3
Migration	3
Size	4
Operation	3
Automation	1
Overall	3.4

INDUSTRY: TELECOMMUNICATIONS

- Number of processors: 3 (2 sites)
- Product installed: Late 1991
- Total support staff: Not available
- Other processors: 3 IBM 3090s
- Amount main memory: 1G, 768M, 768M bytes
- Amount expanded storage: 1G, 1G, 1G bytes
- Number of channels: 96, 64, 96
- Escon channels used: Yes
- Operating system: MVS/ESA
- Application: Batch IMS billing, batch application testing, on-line Imageplus invoice retrieval, DB2/CICS.

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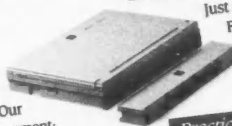
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APPLICATION DEVELOPMENT

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Converting to client/server

Early users of NCR's Cooperation say the benefits outweigh drawbacks

BY ELLIS BOOKER
CW STAFF

ATLANTA — The benefits of client/server computing make it worth the effort of conversion, but users should not underestimate the amount of work involved, according to early users of Cooperation, NCR Corp.'s client/server software environment for enterprise computing.

Cooperation includes development tools, runtime elements and such user applications as electronic mail rolled into an object-oriented, client/server environment. The package is part of NCR's road map for future computing, which the firm outlined two years ago.

"We knew we wanted an

open, client/server technology to deliver applications consistently across the enterprise," explained Gail Port, head of applications development at Citibank NA in New York, which in November 1990 became the first large beta-test site for the NCR product.

"We stressed [Cooperation] more than anyone else; and it stressed us, too," Port quipped, noting that client/server computing is still relatively "immature." In particular, she said, troubleshooting tools such as debuggers and other diagnostic programs, while more powerful than they were just two years ago, are less robust than those found in the mainframe world.

An additional requirement at

Citibank was a system that would work with the bank's hardware and software investments and its disparate, mainframe-based databases. "I have a bias against building infrastructure software," Port added.

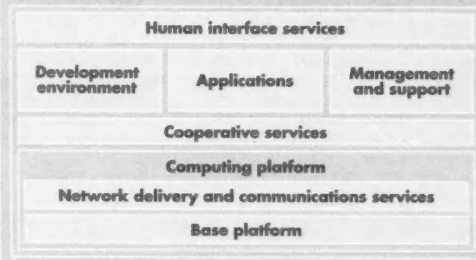
Cooperation is the first element in NCR's Open Cooperative Computing Architecture (OCCA). In essence, Cooperation was designed to bring the robustness, security and consistency typically associated with centralized — or mainframe-based — systems to a standards-based, client/server environment.

The desire for a "single box able to access all our systems, including legacy systems," was likewise the appeal at ITT Hartford, according to Raymond L. Howell, assistant vice president of information management for the insurance company's commercial market segment. The Hartford recently installed Cooperation at its Detroit office — the first in a nationwide rollout of the system.

Howell and Port, as well as Dave Pettigrew, lead software engineer at Mead Data Central, Inc. in Dayton, Ohio, commented on Cooperation during a session at Nucon: '92, an annual NCR user conference held here last month. All three run Coop-

Cooperation

NCR's Cooperation strategy calls for an open systems-based computing architecture



CW Chart: Michael Siggins

eration on NCR 3000 family hosts and personal computer-based local-area networks.

Expert opinion

Both Port and Howell remarked that the young, client/server computing model tends to require more staff experts. "No one at this point understands all the pieces," Port said. Both users also reported that there is more trial and error in developing applications for this model than on older, well-understood legacy mainframe systems.

Finally, end users may have unrealistic expectations for the costs of client/server systems, Port warned. "They may think a \$2,000 PC can replace a \$5 million mainframe," she said.

Nonetheless, Citibank is forging ahead with its client/server conversion. Last month, after

running its Cooperation pilot for more than a year, the bank entered a production mode with the project. According to Port, three mainframe applications will be transferred to the distributed Unix environment next year. In August, some 550 users in 10 cities will transfer to this environment, Port said.

At Mead Data, the new environment was surprisingly easy to deploy.

"We were able to bring up production applications faster than expected," said Pettigrew, who had production users on the software within a month.

Today, three quarters later, Mead Data claims more than 60 Cooperation users — about a dozen of them doing development — who use a mixture of purchased and in-house-developed business applications.

J. D. Edwards enters CASE market with AS/400 tools

BY KIM S. NASH
CW STAFF

DENVER — Users of IBM's Application System/400 can build new applications as well as modify existing programs with new computer-aided software engineering (CASE) tools from J. D. Edwards & Co.

One of the leading suppliers of applications software for the IBM minicomputer line, J. D. Edwards recently announced the following products:

- World CASE/Development Environment, a tool kit that includes a repository, a version control manager and an application generator.
- World CASE/Foundation Environment, a facility for laying down data definitions, menu flow and application processing paths based on user business rules.

Old acquaintance

Although the announcement marks the company's formal foray into the CASE market, the 15-year-old firm has been using these CASE products internally for eight years to build financial and other programs for the AS/400.

Such sales are the company's bread and butter, and the CASE tools are not an effort to break into a new, already cutthroat market, according to Ward Quarles, manager of CASE client service.

"We wanted to give users a way to change and add to their

portfolios and keep all the applications looking the same," he said.

Development Environment is priced between \$7,500 and \$50,000, depending on which AS/400 model is targeted. Foundation Environment is free, bundled into the price of J. D. Edwards' discrete packages.

Sneak preview

Although they were not for general sale until now, the development tools were sold to a few individual users under special agreements. The New York-based accounting firm of Richard A. Eisner & Co., a longtime J. D. Edwards software user, bought Development Environment in 1987 to aid in the company's downsizing from an IBM 3090 mainframe to a group of AS/400 machines.

"By using their application development tools, any programs we develop look and feel exactly the same" as existing applications, said Doug Corpuel, CASE coordinator. "The users really buy into that continuity."

In addition to using J. D. Edwards' products internally, Eisner trains clients on these and other CASE tools, including Application Development Workbench (ADW) from KnowledgeWare, Inc.

Quarles said Development Environment will interface with ADW tools for application planning, a task that J. D. Edwards' product does not now handle.

GUI generators speed development

BY GARRY RAY
CW STAFF

Faced with the burdensome job of hand-coding graphical user interfaces (GUI), software developers said they are getting relief from two updated C application generators that were announced last week.

The development tools are also making it easier to port applications from one GUI environment to another, users said.

GPF Systems, Inc. in Moodus, Conn., last week announced Version 2.0 of its GUI Programming Facility (GPF) programming environment. Upgraded to support IBM's OS/2 2.0, the \$995 tool "can reduce interface development time up to tenfold," according to Stefan Kent, director of sales and marketing at the company.

GPF, according to Kent, allows programmers to build OS/2 applications by selecting and customizing a variety of built-in functions, including windows,

sliders, list boxes and icons. Support is also provided for extended Help systems and prompt lines, multithreaded programming and user-created functions. Once complete, Kent said, developers can use GPF's generator option to produce ANSI C code

"I SLICED MY development time from a couple of months to a couple of weeks."

FRANK CASTELLUCCI
C.O.L. SYSTEMS

and supporting files for OS/2 1.2, 1.3 and 2.0, as well as Microsoft Corp. Windows applications.

Users also noted the reduction in programming time. According to Frank Castellucci, president of C.O.L. Systems,

Inc. in Somers, N.Y., "I sliced my development time from a couple of months to a couple of weeks."

Steve Murray, principal scientist at Analysis & Technologies, Inc. in Middletown, R.I., claimed that GPF "has halved the time it takes us to do a particular product," adding that "the more tangible benefit is better quality code."

Similar programming gains were noted by users of Open Interface 2.0, which was announced last week by Neuron Data, Inc. in Palo Alto, Calif.

Like GPF, Open Interface provides a variety of GUI development tools. However, Open Interface generates C applications code that is portable to a variety of platforms including Windows 3.1, OS/2 2.0, Motif, Open Look and the Apple Computer, Inc. Macintosh. Neuron Chief Executive Officer Patrick Perez said the tool can reduce development and porting time

Continued on page 92

COMMENTARY

Erran Carmel

EMS speeds JAD sessions

Joint application design (JAD) facilitators are discovering that there can be more to JAD than flip charts and donuts.

Enter a class of systems called electronic meeting systems (EMS). EMS puts a workstation in front of every participant in a meeting. Attendees can partici-

pate in the meeting both verbally and electronically, presumably taking the best from both worlds.

JAD sessions can benefit from the electronic component in two ways. The EMS serves to equalize participation. JAD facilitators have always had a challenge in squelching the loudmouth or coaxing the bashful.

When there are 10 participants in a JAD session, each gets only about six minutes of air time per hour. With EMS, participants have equal access to the keyboard, creating a level playing field. One of the key factors in eliciting all participants' feedback is that much of the conversation through EMS software is anonymous.

Second, JAD sessions take a long time

— often days. People begin fidgeting in their seats, and managers get anxious that key employees "get back to work." With EMS, tasks can be "sent out" to the workstations of all participants, who then work at their own speed on those topics in which they have a stake.

Break for business world

Some people call EMS groupware, while others classify it as collaborative computing. But what makes EMS unique is that it supports the act of meeting.

"The business world has been starving for solutions to the inefficient meeting problem," says Roger Volkema, an expert on meetings at the American University in Washington, D.C.

Electronic JAD sessions can be run on

systems from Tucson, Ariz.-based Ventana, which is a spin-off from research done at the University of Arizona. Ventana's product is called GroupSystems, which is composed of a dozen text-based tools that run on a network. Each of the tools is generic and can be used to fit a variety of tasks.

One of the popular tools is Electronic Brainstorming, in which computer files replace the sheets of paper that are circulated among meeting participants as the participants generate and comment on anonymous ideas previously written on these "sheets of paper."

Other EMS products are TeamFocus from IBM and ObjectFinder from ObjectVision in Mendota Heights, Minn.

American Management Systems in Arlington, Va., recently leased GroupSystems for running electronic JAD sessions. "I've been using FAST [Facilitated Application Specification Technique], one of many JAD-like methodologies, and I recognized that EMS can add to the white boards and magnetics of JAD techniques," says Warren Barker who heads American Management's JAD efforts.

Several other organizations are experimenting with forms of electronic JAD sessions, including IBM, the pioneer of JAD.

JAD facilitators have been bringing CASE tools into JAD sessions for several years now. EMS addresses group work issues, which CASE cannot because it is used in JAD sessions in a facilitated mode.

Not all facilitators are thrilled by all the hardware. Some argue that EMS and CASE hurt the "group dynamics" of a meeting, that special atmosphere that emerges after several hours between the facilitator and the user-participants.

Ultimately, it is up to the facilitator. Some can use the computer to enhance the process without losing the "warm fuzzies," while others feel more comfortable with markers and easel paper.

Carmel is assistant professor of MIS at the American University in Washington, D.C.

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	Software 2000	J.D. Edwards	Ross	DBS	Oracle
Same version for Multiple Platforms	YES	NO	NO	NO	NO
Client/Server Support	YES	NO	?	?	NO
Graphical Interface	YES	NO	NO	YES	YES
Full Screen Printing	YES	NO	NO	YES	NO
Business Process Reengineering	YES	NO	NO	NO	NO
Multi-Media Architecture: Image, Data, Text.	YES	NO	NO	NO	NO

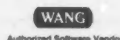
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GUI generators relieve users

CONTINUED FROM PAGE 91

"by more than half."

Users might consider that a conservative estimate. According to Jack Dangerman, CEO of Environmental Systems Research Institute, Inc. in Redlands, Calif., Open Interface "cut a year off of the development time" of the company's geographic mapping product, called ArcView. "We originally developed [ArcView] on Unix, and it was instantaneously operable" when ported to Windows, he said.

Such claims are often discounted as sales hype, but James C. Mendelson, computer software and services analyst for New York investment bank Morgan Stanley & Co., said he believes that "with the explosive growth of Windows and the array of GUIs that are out there, there is significant interest in developing applications that take advantage of these easier to use [programming] environments."

Prices of Open Interface range from \$7,500 to \$15,000 plus additional fees for runtime licensing.

IN BRIEF

IBM acquires equity in Sapiens

■ IBM has acquired an equity position in **Sapiens International Corp.**, a software firm in Cary, N.C. In conjunction with the investment, Sapiens announced that it will port its rules-based application development tool, Sapiens Workstation, to the OS/2 platform.

■ The Chatsworth, Calif.-based **Dyaklor Division of Sterling Software, Inc.** has acquired Dynatest for Windows, a programming aid, from Innovative Business Systems, Inc. A testing program for the development of Microsoft Corp. Windows applications, the

product will include a test controller, test script editing and debugging and timing measurement. The product will be renamed Sterling TestPro for Windows.

■ **Knowledge Information Systems, Inc.** in Hazlet, N.J., has announced q*BASE.EXE, an Xbase compiler for The Santa Cruz Operation's SCO Unix platform. Q*BASE.EXE can combine Xbase files and C files into the same executable file, and it supports multiuser database programs. Available in workstation and server versions, there is no additional charge for runtime licenses.

■ **Borland International, Inc.** in Scotts Valley, Calif., has released Turbo Pascal for Windows 1.5. Compatible with Microsoft's Windows 3.1, the compiler supports Object Linking and Embedding, common dialog boxes, drag-and-drop functions and TrueType fonts. New features include a Resource Workshop to aid in interface design and an updated Turbo Debugger for Windows.

■ **SunPro**, a Mountain View, Calif.-based subsidiary of **Sun Microsystems, Inc.**, has released Version 1.1 of its Sun Ada Development Environment. It can increase applications performance by up to 30%, the company said, and it is now available with network licensing.

■ **UGC Consulting** in Denver has signed application development deals with **Hughes Information Technology Co.** and two other companies as part of a strategy to provide customized mapping and geographical information systems applications.

UGC and Aurora, Colo.-based Hughes will team up to jointly develop applications.

Meanwhile, UGC said it has been working with **Hitachi Software Engineering Co.** in Tokyo and **Information & Graphic Systems, Inc.** in Boulder, Colo., to develop specialized data-conversion software called DB-Able. That software can be used with UGC's UserWorks set of structured conversion management methodologies.

NEW PRODUCTS

Development tools

Motorola, Inc. has announced VMEexec 2.1, an update of its real-time application development environment.

According to the company, the product's features include a runtime executive, a strong runtime connection to Unix, development tools and comprehensive device driver support.

Embedded real-time applications are developed under the company's enhanced version of Unix and then downloaded to Motorola M88000 and MC68000 target systems for debugging.

Pricing for the start-up kit begins at \$5,200; a combined version supporting both types of target board costs \$7,500. The kit will be available this month.

Motorola
2900 South Diablo Way
Tempe, Ariz. 85282
(602) 438-3576

Micro-Processor Services, Inc. has devised a PL/1-to-C language-conversion tool.

The PL1C Translator Series converts software libraries from a variety of PL/1 dialects to C language code.

Built-in math, string manipulation and I/O functions are converted to external calls, and comments are moved unaltered to the target C language file. Source code errors are flagged and displayed in a report.

The PL1C Translator Series software runs on DOS-based personal computers. Introductory pricing is set at \$975.

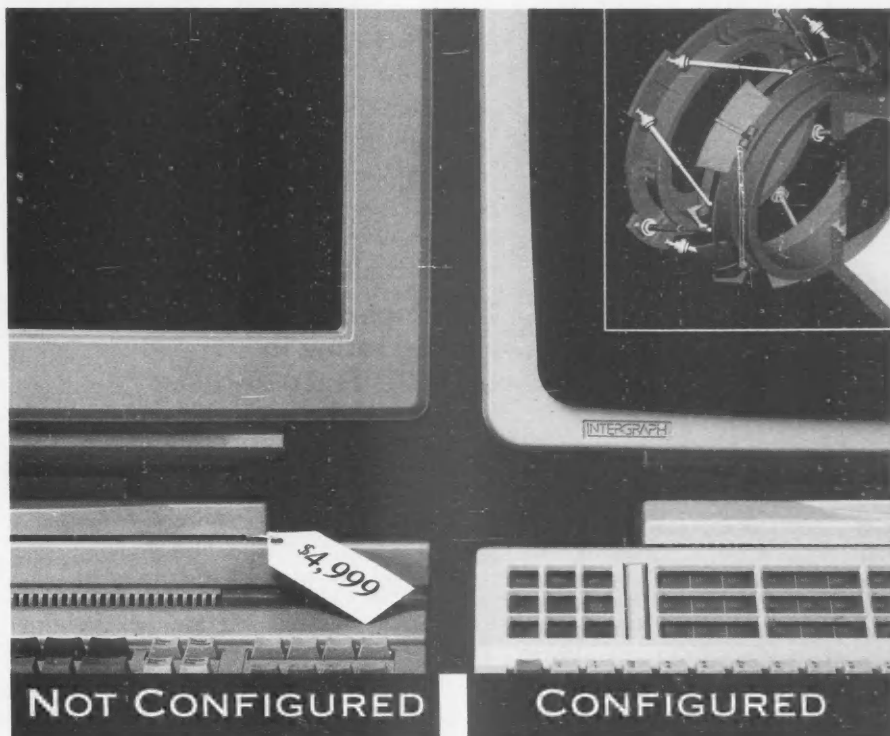
Micro-Processor Services
92 Stone Hurst Lane
Dix Hills, N.Y. 11746
(516) 499-4461

Science Applications International Corp. has announced the SAIC Visual User Environment (VUE) Developer's Toolkit.

SAIC VUE is a graphical user interface that simplifies Unix for the end user and provides a consistent interface across heterogeneous hardware platforms, according to the firm. The product lets users develop enhanced Motif applications, integrating the SAIC VUE interface.

The SAIC VUE Developer's Toolkit is available for Sun Microsystems, Inc. workstations and costs \$1,250.

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As for maintenance, a Gartner Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

Now, develop on PC and generate for DEC/VMS, UNIX. TANDEM, WINDOWS available soon.

The IEF has generated applications for IBM mainframe

environments (MVS/DB2 under TSO, IMS/DC and CICS) since early 1988. Now you can develop systems in OS/2 and automatically generate for DEC/VMS and some UNIX platforms. TANDEM, Microsoft® WINDOWS, and more UNIX will be available soon.

Developers give IEF highest rating in COMPUTERWORLD.

COMPUTERWORLD magazine's "buyer's scorecard" showed that developers ranked the IEF first among all I-CASE products in the study, particularly in the areas of application quality, programmer productivity, and value for the dollar.

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The kit is priced at \$10,000 (limit one per customer company). That's about one-half the regular cost of the toolsets.

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Government purchasers, please reference GSA #GS00K92AGS5530

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VP, Information Technology
AETNA



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Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce Aerospace



"With previous methods, we would have had to compromise on an 'okay' 10-screen Lease Accounting system. With the IEF, our users got everything they wanted—an outstanding 40-screen system—in the same time. They are requesting the IEF for all future systems."

Tom Jeffery
Sr. VP, Information Systems
Target



"The IEF offers dramatic improvements in productivity, yet it's easy to learn. One example: We trained 23 developers, including 18 new hires, and then completed a large order processing system—300 transactions—all in only 20 months."

Venkat (Vinnie) Tiruvilumala
Director, CPC/CPIC Information Systems
SONY Corporation



"We used an IEF frequent flyer template to build our 'Canadian Plus' system. A major redesign, estimated at 4-6 months using previous methods, took less than a month. Now we're providing better customer service, and maintenance costs are greatly reduced."

Bill Palm
President, Canadian Technology Services
Canadian Airlines



"Our new Customer Order Services Marketing Information System—over 500 transactions and 250 entities—is in production. Quality is excellent and our users are very pleased. Dedicated people armed with the IEF advantage have made COSMIS a success."

James R. Engle
Director, Systems and Programming
Rhône-Poulenc Rorer



"Your new IEF tutorial was a way to quickly become familiar with the IEF and see how the IEF will allow quality systems to be built very quickly. I feel I now know how to build systems using the techniques described."

Roger Strand
Application Development Consultant
First Federal Lincoln



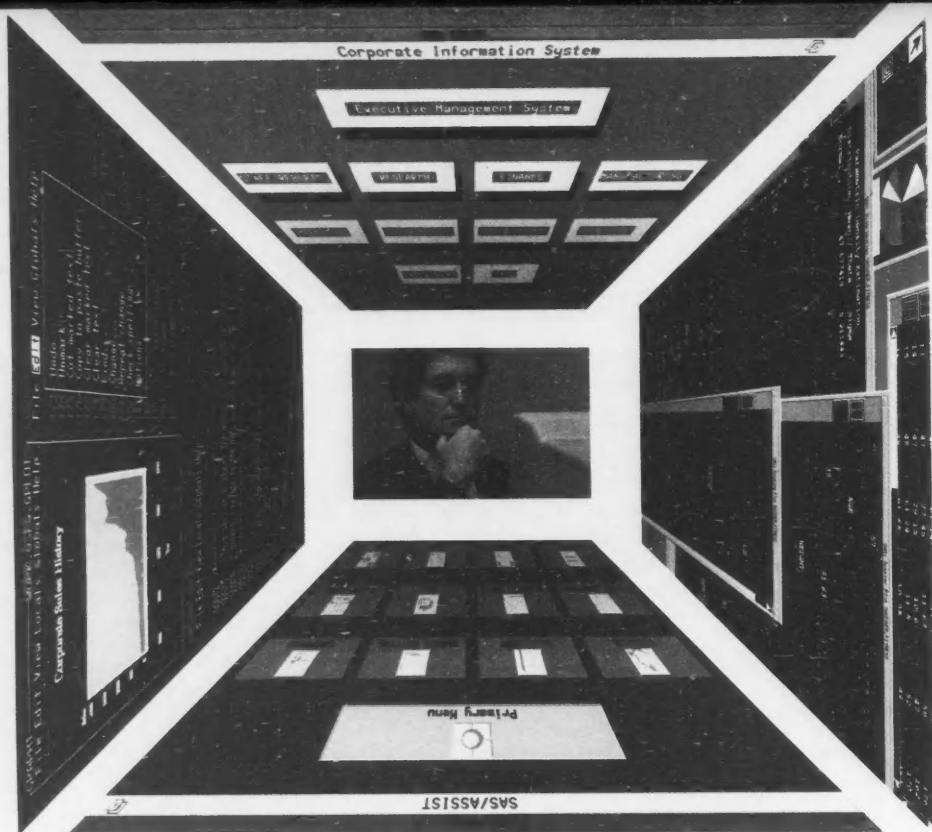
"The IEF tutorial is very well done. I feel comfortable with this software and I have acquired the skills to build simple systems. The tutorial is a very fast and effective means of evaluating the capabilities of the IEF."

Margaret Kubaitis
Research Programmer, IS&S
University of Illinois



"The IEF tutorial is put together very well and quickly illustrates how to construct a system using the IEF. It gives one the basics to start getting the job done. I feel I am prepared now to build simple systems using the IEF."

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INTEGRATION STRATEGIES

OPEN SYSTEMS

Pilgrims progress on the open road(s)

BY DENNIS LIVINGSTON
SPECIAL TO CW

The nirvana of open systems is being sought fervently by companies large and small. But as in any search for paradise, the best way to get there is subject to much debate.

The many pilgrims seeking true, blissful openness are united not by a single path but by a shared vision: A world in which all hardware and software speaks to

each other, and data is shared freely among all machines. The number of zealots and converts grows daily.

"We brought in an isolated island of open systems, but we couldn't keep the programmers off of it," says Michael Higgins, technical support manager at Byer California.

The San Francisco-based women's apparel manufacturer set up a small open systems pilot three years ago consisting of Sequent Computer Systems, Inc. hardware and Oracle Corp. software. "From that moment on, we've never looked back," Higgins says.

Today, the company has scrapped its proprietary Prime Computer, Inc. systems and expects its software to

be completely open in 18 months.

In 1990, only about 6% of 2,400 organizations surveyed by DMR Group, Inc., an international systems integrator, had adopted an open systems policy. By 1991, the firm says, that figure had leapt to 15%. "My guess is that it's now at 20% or more," says Robert Howie, a DMR director in Boston.

And demand for open systems seems destined to keep growing. No wonder: The rewards are attractive indeed, including improved productivity, more satisfied users, less equipment and lower training costs. More importantly, adherents say, true openness will let companies port applications around diverse environ-



Illustration by Janet Genova

ments and help them to more easily establish enterprisewide networks.

What makes this vision more than "pie in the sky" is the existence of de facto and formal standards such as Unix, Transmission Control Protocol/Internet Protocol (TCP/IP), Posix, X.400 and many others. And because open systems by definition are democratic, all standards must be publicly available, widely adopted and devel-

oped through a consensus process, rather than by any one vendor exclusively. The existence of the Uniform Association, the X/Open Consortium Ltd., the Corporation for Open Systems, Open User Recommended Systems and other cultic evangelists attests to the popular nature of openness.

Most gurus and groups generally
Continued on page 99

Tiny dynamos advance the faith

Small integrators are leading the open systems crusade — and earning attention from users and big foes

INTEGRATING OPEN SYSTEMS

Small specialized integrators

BY MARK MEHLER
SPECIAL TO CW

Call them the mice that roar. Combined, approximately three dozen or so upstart integrators specializing in nonproprietary systems command no more than 1% or 2% of the \$15 billion U.S. integration market.

Yet these tiny specialists are on the front lines of companies converting — so far mostly at department level — to open environments. These open boutiques are also drawing the attention of larger competitors, information systems managers and computer systems vendors, and they are shaping the future of the commercial systems integration business.

According to Ira Sager, a principal at ParaTechnology, Inc., a Bellevue, Wash.-based research and consulting

firm, small integrators "have taken the [marketing] mantle of the open systems movement."

Compared to well-known giants such as Electronic Data Systems Corp., SHL Systemhouse, Inc. and Andersen Consulting, the specialists are virtual unknowns: BSG Development in Houston; Babbage-Simmell and Associates in Dublin, Ohio; Minerva Technology, Inc. in Calgary, Alberta; and Lante Corp. in Chicago. These specialists typically have fewer than 20 employees and annual revenue of less than \$30 million.

Yet their success to date far outstrips their size.

Fast turnaround lauded

IS managers with experience in dealing with the emerging class of open systems specialists tend to be impressed.

Paul Ricker, vice president of IS at G. Heileman Brewing Co. in LaCrosse, Wis., hired Minneapolis-based Super Solutions Corp. to move its 3090 applications to a Pyramid Technology Corp. Unix platform and an Oracle Corp. database environment.

"We were in a hurry," Ricker recalls.

"We couldn't afford to sit down with a large integrator and write con-



Shot: Weidemann

G. Heileman Brewing's Ricker: "We were in a hurry"

tracts dotting every 'i' and crossing every 't,'" he adds.

Super Solutions, which specializes in mainframe knockoffs for Unix and

Unix clones, turned around the job in 12 months at a cost of approximately \$250,000, according to Ricker.

Continued on page 104



MICHAEL SILVERSTEIN, MANAGER,
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Pilgrims progress on the open road(s)

CONTINUED FROM PAGE 97

agree that true "openness" must be built on the three pillars of interoperability, scalability and portability. *Computerworld* recently caught up with several companies on their respective journeys to open bliss. Their stories follow.

COMMANDMENT I

Thou Shalt Be Interoperable

Different systems and/or applications must be able to communicate and exchange data easily.

For Consumer Health Services, Inc., the path to open systems began by installing Unix platforms linked by TCP/IP.

The Boulder, Colo.-based firm uses an extensive database to match callers with local doctors and dentists. The database contains information on where a doctor went to medical school, treatment procedures, insurance accepted, directions to the office and other details.

"We had to rebuild our entire information system in the process of migrating

from a proprietary minicomputer platform and 88 different databases to a more efficient technology," says Barbara Kostanick, IS director at the firm. "The old system carried a lot of overhead and didn't allow us to respond quickly to changing market conditions."

The company considered going to either a proprietary mainframe, a fault-tolerant system or a Unix-based client/server model. The first two options were quickly dropped because of their high cost, she says.

"A big staffing increment would be required just to put in a mainframe," Kostanick says. "And the extra cost of a fault-tolerant machine wasn't justifiable, given the high reliability of today's hardware. We found that competition among Unix vendors is doing more to drive down price and increase performance than in any other part of the industry we examined."

Consumer Health now uses three SPARCserver 490s from Sun Microsystems, Inc. One of these servers carries a consolidated database written in C and a Sybase, Inc. fourth-generation language

(4GL). The other two servers handle report writing and software development, respectively.

The company also chose TCP/IP over Open Systems Interconnect (OSI), an alternative network protocol standard.

"OSI has been the promise of the future for some time, but it isn't really here yet," Kostanick says.

COMMANDMENT II

Thou Shalt Be Scalable

Software will continue to work effectively as it is moved from a desktop computer to a minicomputer or mainframe system.

Scalability was an important element in open systems planning at American Airlines Decision Technologies. This American Airlines subsidiary, located at Dallas-Fort Worth Airport, models and optimizes alternatives for allocating aircraft to flight schedules.

Scheduling analysis takes into account

With all the hype about open systems and nonstandard standards, it's wise to prototype everything yourself, Whitney says.

Technical challenges

Besides testing everything itself, Mead Data makes vendors prove that things work together as promised.

At Millipore, Poulin found that a lot of CPU and memory power was needed to support the 400 users running on-line applications. "We've taken what would be a single Oracle database environment and split it across several machines. It's not unusual, but it complicates the situation."

At Byer California, IS had to deal with the challenges of a speedy conversion after users showed high interest in an open systems pilot.

With more than 200 users to support, Higgins says, 3G bytes of data and another gigabyte of programs, binaries and libraries had to be moved quickly.

"In the proprietary environment, we had a menuing system and command line language," Higgins says. "But those were radically different from those in the Unix environment. We had a big technical services hump to get over."

Specifically, the firm had to duplicate the functionality of the proprietary support utilities used on the older Prime Computer, Inc. systems.

Yet another challenge is figuring out the best way to expand various Ethernets into the remaining proprietary environments, including a computer-aided design and manufacturing system used to design garment patterns.

Finally, handling the myriad electronic data interchange (EDI) protocols that suppliers use is also a big challenge, Higgins says. Different suppliers want to use everything from asynchronous communications to Systems Network Architecture and X.25.

"We used to be able to say we couldn't do all of those, but now we can't," Higgins says. So although EDI has given Byer a step up on competitors, "We no longer have the nice and convenient 'No.'"

such factors as availability of airplanes and crews and the length of time the aircraft must remain on the ground. Even small changes may result in millions of dollars saved in fuel and aircraft orders.

"We wanted to move from an inflexible, obsolete mainframe scheduling system to one that could take advantage of changing technology as it appears," says Terry Smith, a principal at Decision Technologies.

"We also wanted to be able to buy special-purpose hardware from a variety of vendors for particular tasks, such as database computation. We have about 75 analysts doing scheduling studies, and they don't all have the same computing needs," he says.

Unix fulfilled these requirements for Decision Technologies. The company's database now resides on a 6280 from Mips Computer Systems, Inc. Applications are executed on 100 Unix boxes from Mips, Sun, Hewlett-Packard Co. and IBM. "You can buy Unix boxes in a wide variety of price/performance points, without being restricted at the high or low end," Smith says.

He adds that he has had no trouble finding commercial, generic visualization and statistical analysis Unix packages that his staff can adapt for the analysts.

"We expect new modules to appear on Unix boxes before reaching mainframes because vendors want to take advantage of the larger Unix market," Smith says.

COMMANDMENT III

Thou Shalt Be Portable

Software must be movable at source code level among computers of different architectures.

Some companies consider portable 4GLs an important element of open systems. American National Can Co., for instance, turned to the PowerHouse application development system from Cognos, Inc. for developing applications on HP computers that can be retrofitted to Data General Corp. equipment without a lot of effort.

American National Can's programs handle quality control, productivity and related data gathered from plants around the country, where the firm manufactures metal, plastic and glass containers.

PowerHouse runs on both Unix and proprietary operating systems used on platforms from DG, HP, IBM and Digital Equipment Corp., according to Don Brungard, vice president of IS.

"This is one of the few application languages that lets you choose whether to be open by running on compatible Unix boxes or on selected machines running proprietary systems," Brungard says.

"Applications written with PowerHouse are almost instantly portable across several major platforms. Normally, you don't get such hardware independence if you use a proprietary operating system. That's what openness is all about — controlling your own destiny," he says.

Another advantage, Brungard says, is that once people are trained in an application written in the PowerHouse environment, the company doesn't have to worry about getting them up to speed on each platform running the application. ■

Livingston is a free-lance writer based in Brookline, Mass.

Dealing with bumps on the way

INTEGRATING OPEN SYSTEMS

Millipore Corp.
Byer California
Mead Data Central, Inc.

BY ALAN J. RYAN
CW STAFF

There's no such thing as a smooth ride with open systems.

Companies migrating from proprietary to open environments say people issues and technical conversion problems make life... well, interesting.

Finding people who know how to migrate to and run open systems can be a big challenge, according to experienced hands.

Millipore Corp. in Bedford, Mass., for instance, found that a lack of Unix skills complicated its switch from a mix of proprietary systems to Sequent Computer Systems, Inc. systems. "We had no internal skills on Unix," says Dan Poulin, director of information systems operations at the \$770 million corporation. "That's a steep learning curve."

Millipore is halfway into a four-year migration from IBM, Hewlett-Packard Co., Data General Corp. and other hardware to the Sequent Symmetry systems running Oracle Corp. databases. The goal, Poulin explains, is to reduce the number of systems IS must support.

Similarly, no one at Byer California, a women's apparel manufacturer in San Francisco, had the Unix experience needed to operate its new systems, technical support manager Michael Higgins says.

"I had never seen Unix up front in my

life and was actually a bigot about it," Higgins says.

Fortunately, he says, Sequent provided plenty of help, including hot line support. "I consider myself to be an adept Unix administrator today, but it was certainly interesting to learn there," Higgins says.

At Mead Data Central, Inc., lack of Unix experience cropped up, says Gary Whitney, director of systems evaluation at the Mead Corp. subsidiary. The Dayton, Ohio, company is moving from multiple IBM and compatible mainframes running MVS to an NCR Corp.-based open system.

Whitney says he had to hire a Unix ex-



pert from outside to help in the migration. An even bigger challenge, he adds, was to get people to think "open."

"When you've been a mainframe environment and are transitioning mainframe people, they tend to think of applications as large blocks of processing," Whitney explains. "It's difficult for them to break that down into smaller pieces and think about how you distribute data and get all of these pieces to fit together."

To speed the process, Whitney employed "early adopters." These boosters would help the open systems project from its inception. Even so, he says, support waxed and waned. "It takes a lot of prodding, educating and letting them work things out to keep going with this type of environment. We still have our share of nonbelievers, even today."

Ryan is a *Computerworld* associate editor, features.

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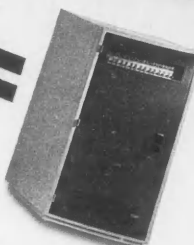
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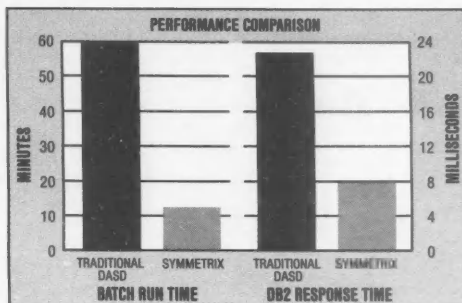
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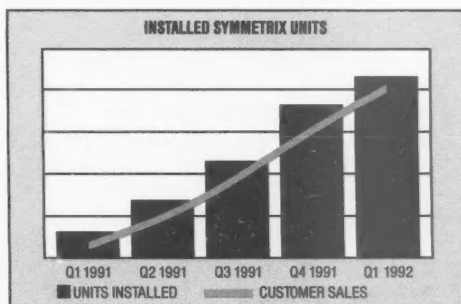


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INTEGRATION STRATEGIES

Two early converts keep on marching

INTEGRATING OPEN SYSTEMS

DHL Worldwide
Express
Hyatt Hotels Corp.

BY JOHN KAFALAS
SPECIAL TO CW

Two early pioneers in the open systems movement have calloused feet but smiling faces.

According to DHL Worldwide Express and Hyatt Hotels Corp., the shift from proprietary life was hardly easy. But would they turn back? Not a chance.

Savings on software, support and application development time has made it all worthwhile, according to information systems directors at each firm.

DHL Worldwide

Redwood City, Calif.-base DHL took its first halting steps toward open systems in 1986. Surprisingly, says Michael Lanier, chief information officer at DHL's American operations, the idea came from top management.

DHL, which delivers packages in the U.S. and in 194 countries around the world, had been using an IBM mainframe and a network of System/36 minicomputers running package tracking and corporate accounting software.

With the management mandate, the company purchased its first Unix systems from Pyramid

Technology Corp. and Hewlett-Packard Co.

Since then, DHL has added Unix-based minicomputers and workstations from several other vendors, plus Apple Computer, Inc. Macintosh and DOS desktop machines. DHL's domestic systems are connected by an X.25 network, while the overseas machines communicate via the Societe Internationale des Telecommunications Aeronautiques (SITA) network.

With so many changes, problems were inevitable. The three thorniest, according to Lanier, were handling communications among different vendors' Unix systems, distributing data among the systems in the worldwide network and containing system integration and maintenance costs.

Here's how DHL is tackling the problems:

• **Communications:** DHL is developing an "encoder/decoder message switch" to act as a data interpreter. Developed using Pipes Platform, a software tool from PeerLogic, Inc. in San Francisco, the encoder/decoder is the key to getting DHL's multivendor array of Unix systems on speaking terms. It is expected to be on-line later this year.

When the encoder/decoder, which runs on each of the several hundred network nodes, receives a message, it translates the message into the data format and protocol used by the recipient node (if the incoming message is in a different data format or protocol). This makes it possible to run the same application on different hardware platforms

An open and closed case

Comparing costs shows that proprietary systems are cheaper for one user, but open systems are more economical for 10

One user		10 users	
Software			
Operating system Spreadsheet Word processing Database GUI		Operating system Spreadsheet Word processing Database GUI	
Open	Proprietary	Open	Proprietary
\$3,175	\$2,134	\$9,935	\$14,410
Hardware			
Unix systems, Intel 80386/30, 150M-byte hard drive, 4M-byte RAM, VGA	MS-DOS system, Intel 80386/20, 150M-byte hard drive, 1M-byte RAM, VGA	Unix systems, Intel 80386/33, 300M-byte hard drive, 8M-byte RAM, VGA, X Window terminals	MS-DOS system, Intel 80386/20, 150M-byte hard drive, 4M-byte RAM, VGA networking cards
Open	Proprietary	Open	Proprietary
\$3,500	\$3,500	\$18,000	\$35,000
Total	Total	Total	Total
\$6,675	\$5,634	\$27,935	\$49,410

(Does not include implementation, training or maintenance costs)

Source: Donnelly & Associates, Inc.



Andy Freeberg

DHL's Lanier says after the switch, communications, data distribution and maintenance costs were the biggest challenges

while retaining the ability to share data, Lanier explains.

• **Data distribution:** DHL is establishing a central data repository in Houston. The system will be based on an IBM Enterprise System/9000 mainframe running MVS/ESA and IBM's DB2 relational database management system.

The ES/9000 will act as a "data warehouse" for customer account data, package shipment data and related information. When the project is complete, the ES/9000 will be surrounded by distributed "rings" of Unix systems, mostly IBM RISC System/6000s.

These will run AIX and Sybase, Inc.'s RDBMS and the Open Gateway AIX-to-mainframe interface. The AIX/Sybase systems will query the mainframe for data, which will in turn be made available to remote systems worldwide via the X.25 and SITA networks.

• **Controlling costs:** The shipping firm has entered into single-point-of-contact (SPOC) relationships with AT&T Communications for telecommunications equipment and with IBM for computer equipment.

Lanier says DHL expects to save between 25% and 40% on system maintenance costs as a result of the SPOC arrangement.

Hyatt Hotels

At Hyatt Hotels, a single application package sparked a company shift to open systems.

For the 160-site Chicago-based chain, the move to Unix-based open systems began in December 1987. Since then, a substantial investment and a gradual conversion have made the move pay off, according to Gordon Kerr, senior vice president for MIS.

Five years ago, Hyatt officials were looking for a software application to track numerous indi-

vidual hotel functions. They eventually chose Encore Property Management System, a Unix-based application from Encore Systems, Inc. in Atlanta.

For a hardware platform, Hyatt chose AT&T 3B2 Unix systems for all but its largest hotels. Bigger properties, which needed more power, got HP 9000/850 machines running Encore. Today, nearly all of Hyatt's hotels use the Encore property management package.

With the primary system up, the door was open for other Unix-based applications. Next, Hyatt needed an RDBMS for in-house applications such as tele-marketing and human resources. IS officials chose Informix Corp.'s Informix, which runs on most Unix systems and has a fourth-generation language (4GL). Kerr says that in terms of programmer hours, the 4GL is "two to three times as productive as C" for writing applications.

By 1990, Hyatt decided it was time to rewrite its central reservation system. The old system ran on an IBM 4381 under IBM's Transaction Processing Facility, which Kerr says was cumbersome and difficult to modify. Hyatt replaced the 4381 with an AT&T System 7000 and began a development effort that took about 100 programmer-months. The reservation system was rewritten in the Informix 4GL and put into service in August 1990.

Kerr says that a key to Hyatt's success in switching to Unix has been converting in steps, one application at a time. The best approach, he adds, is to convert small, stable applications first. "That way, you can get up the Unix learning curve without getting distracted by things that have nothing to do with Unix itself," he says.

Kafalas is a free-lance writer based in Hudson, Mass.

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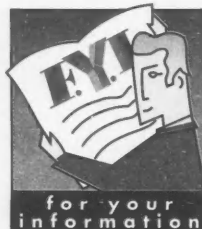
INTEGRATION STRATEGIES

Oregon blazes trail toward open systems conformance

► Government in the Beaver State is switching to open systems. A new policy mandates that agencies drop proprietary systems as quickly as possible.

Officials say the goal is to build a common, state-wide computing environment. Guidelines call for Posix and Federal Information Processing Standard conformance.

Some 1,600 information systems executives were asked if they were pursuing Unix-oriented strategies. Most likely to switch: IBM 4381 sites (56%), all mainframes (52%), IBM 370/390 and other mainframes (49%).



Who's doing Unix?

► Companies downsizing from mainframes are also likely to adopt Unix, according to a new International Data Corp. survey.

OSF enhances Motif

► The Open Software Foundation has improved its Motif graphical interface. Version 1.2

offers more of a personal computer look and feel but retains binary compatibility with existing applications.

Small integrators take lead in open systems crusade

CONTINUED FROM PAGE 97

"They understood the nature of the job in terms of our costs and need for flexibility," Ricker says. "In my experience with large integrators, they will hit you with an adjustment for any tiny change in the project. We needed an integrator who would put itself on the line."

Paul Bandrowski, a senior advanced technology analyst at Sara Lee Corp. in Chicago, is evaluating small open integrators. The nation's 33rd largest corporation wants to downsize mission-critical mainframe applications and develop new applications in local-area network-based environments.

Bandrowski says that while the big integrators are "good at managing projects, they are not good at managing the components of those projects."

"What some of the smaller companies have is the understanding of the end user — the people interface," Bandrowski insists.

Big boys take notice

Large integrators, analysts, customers and product vendors, meanwhile, acknowledge the impact of the small independent specialists in building momentum for open systems.

The major integrators are all moving to enhance their open systems skills, through either internal development, acquisition or strategic partnership.

"These departmental-level competitors have reinforced the decisions we already made to augment our client/server skills," says Peter Abene, EDS' director of corporate market analysis.

Abene confirms that EDS, which over the past two years has developed an internal client/server training curriculum, has held discussions on acquiring open systems integrators, both to build its technical expertise and to expand geographically.

"The majors don't yet have the knowledge, and they may be overselling their skills, but they will get there," Sager says.

Early lead seen

As evidence, Sager notes three things — EDS' acquisition strategy, Andersen's recent decision to implement 20,000 copies of Lotus Development Corp.'s Notes for itself and its customers and SHL's bold client/server initiatives — that all reflect the influence of the open systems specialists.

But some observers see these small U.S. specialists as holding the early advantage. There are several reasons.

For openers, the open boutiques maintain experienced staff and a track record of managing open projects.

"You can't take Cobol programmers used to working on a mainframe and suddenly have them churning out C code with embedded SQL talking to a relational database in a distributed environment," says Revett Eldred, chairman and founder of Minerva, one of the feisty new breed of specialists.

Formed in 1985, the \$8 million company has tackled personal computer integration jobs at American Airlines and British Petroleum Canada, Inc., among other Fortune 1,000 clients.

More importantly, Eldred

Big Blue, ERI team up

► IBM and Hauppauge, N.Y.-based integrator ERI announced a new partnership. IBM will market ERI's systems integration services with IBM RISC System/6000 workstations and other IBM hardware and peripherals aimed at the trading floor.

Worldwide OSI testing

► U.S. and European computer makers are working to introduce interoperable systems and equipment that can be used on both continents. A Brussels-based standards group has launched the Process to Support Interoperability. As a public service, manufacturers are invited to test their products for Open Systems Interconnect compliance.

Japan's opening, too

► The U.S. and Japan may en-

joy more computer interoperability. A little-noticed clause in a trade agreement inked between the two nations in January contained a commitment to open systems. The idea is to open up the \$9 billion Japanese market to increased competition. A Japanese government group will look for ways to promote a multi-vendor open systems environment. Foreign and domestic firms will be invited on a nondiscriminatory basis to assist.

SCO, Novell make plans

► The Santa Cruz Operation (SCO) has paired with Novell, Inc. to develop products that better integrate the SCO Unix operating systems with NetWare. Companies say the products will let NetWare users use DOS and OS/2 personal computers to access more than 3,000 Unix programs, including client/server applications and databases.

says, open systems integrators tend to be run by sales-oriented entrepreneurs rather than seasoned professional managers. As a result, he argues, specialists are more adept at opening new markets and managing the free-wheeling, ponytailed, object-oriented programmers whose skills are now in such great demand.

Also, most specialty open systems integrators don't resell hardware or software, which gives them more platform independence and a lower capital cost base than big players.

Finally, the open boutiques tend to share an "I can do any open systems job better than any big integrator" attitude.

"These people come out of a procedure code mind-set," says Larry Tanning, sales vice president at Super Solutions. "Migrating millions of lines of Cobol off of MVS takes you into very complex issues of networking and Unix commands. The [majority] can't address those, let alone the applications."

Sought by vendors

Product vendors, meanwhile, are increasingly seeking out specialists in Unix and other open systems as strategic partners. Oracle has preferred integration relationships with 30 integrators, a number of which are members of the emerging open systems class.

Oracle's Chicago regional manager Bill Conroy says the best of the crop can bring the database vendor in on multimillion dollar deals with Fortune 50 and 100 accounts.

"It's true that these integrators lack market share," Conroy says. "But you'd be shocked at the high-level client relationships they've fostered."

While open specialist integrators are ascendant now, opinions differ on their long-term fate.

SPECIALISTS

A sample of the three dozen open systems vendors.

BSG Development
Houston, Texas

Babbage-Simmell and Associates
Dublin, Ohio

Lante Corp.
Chicago, Ill.

Super Solutions Corp.
Minneapolis, Minn.

Minerva Technology, Inc.
Calgary, Alberta

Kuevera
Sausalito, Calif.

Fusion Group
New York, N.Y.

Uniquality, Inc.
Systems Solutions
Oakbrook, Ill.

George Newman, director of services research at Framingham, Mass.-based International Data Corp., says small specialists and big integrators will eventually bump into each other.

"Lante, BSG and other network integrators have to go from the departmental level up," Newman says. "Meanwhile, the Big Six are driving down. So you'll see top down, bottom up. You already see signs of that."

He notes that a consortium of small network integrators known as The Assett Group has begun courting wide-area network business via Infonet. "The most successful of these companies will evolve into more than seven- to eight-man consultancies," Newman says. •

Mehler is a free-lance writer based in Jackson Heights, N.Y.

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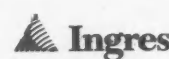
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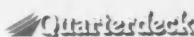
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Organizations



88open, a member consortium, fosters an open systems shrink-wrapped environment among 88000-based system vendors through standards, testing and cooperative activities. 1-408-436-6600



Network Management Forum, an international consortium, delivers open, interoperable solutions for end-to-end management of communication networks and information systems. 1-908-766-1544



The Open Software Foundation is a non-profit software R&D organization working to further open systems development and adoption. 1-617-621-7300



An open consortium of 265 companies taking an active role in directing the future of UNIX System V and related software. 1-201-263-8400

Publication



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Words from the wise . . .

Gary Donnelly
President
Donnelly & Associates, Inc.
Reston, Va.

Unix is not necessarily open.

"You can have an open system in which Unix plays a minor part or a Unix system that isn't really open. Unix vendors frequently offer unique enhancements to their systems to differentiate themselves from the rest of the pack. That's not necessarily bad.

"But if you take advantage of the features of one vendor's Unix, your software

may not work if you move to another vendor's box that lacks these features. You're locked into the first vendor, just as you would be with a proprietary system from IBM or DEC."

Robert Howie
Director
DMR Group, Inc.
Boston

Don't forget migration planning.

"Your business objectives must be clear before you start buying open prod-

ucts. You need a road map from where you are now to where you want to go.

"People affected by open systems should be involved in the process of defining open systems design principles or else any plan won't be long-lived. You can't implement open systems by executive fiat."

Bill Biaggi
Director of
information technology
Corporation for Open
Systems International
McLean, Va.

Justifying may be tough.



"Open systems are usually justified on the basis of reducing hardware costs and staff training. But open systems haven't yet evolved to the point where their functionality and services are that much greater than what you can get with proprietary systems. Users won't buy off on an open system until you can show the value-added benefits an enterprise gains from bringing in open technology.

"You're the one who has to be sure that the equipment you pick from different vendors can communicate using the protocols you want. Open systems place more responsibility on getting users the education they need."

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Open yourself up to some help

Several publications are available that provide information about the obstacles to open systems, standards that facilitate "openness" of applications and equipment and products that comply with those standards. Here's a sample:

Applications Portability Profile, National Institute of Science and Technology, Bethesda, Md. (301) 975-2833.

Managing Open Systems, Faulkner Information Services, Pennsauken, N.J. (800) 843-0460.

Open Systems Handbook, Digital Equipment Corp., Maynard, Mass. (508) 493-5111.

Standards-Based Architectures, DMR Group, Inc., Boston (617) 237-0087.

X/Open Portability Guide, X/Open Consortium Ltd., Menlo Park, Calif. (415) 323-7992.

TOOLS

A Selected Biography of Unix and X Books. Covers programming, security, system administration. O'Reilly & Associates, Inc., Sebastopol, Calif. (800) 338-6887.

Electronic Mail Demystified. Written for technical and management-level users in open systems environments. UniForum, Santa Clara, Calif. (800) 255-5620.

Managing Open Systems. Free report that shows how open systems work in the real world and how to protect your computing investment. Faulkner Information Services, Pennsauken, N.J. (800) 843-0460.

CALENDAR

The Interop '92 Spring Conference and Exhibition, Washington, D.C., May 18-22. Keynote speakers: Mitch Kapor, Dixon Doll. Contact Interop '92 at (415) 941-3399 or (800) INTEROP.

OpenForum '92, Utrecht, The Netherlands, Nov. 25-27. The conference will be sponsored by UniForum, EurOpen, Reed Exhibition Cos. and Royal Dutch Fairs. Call UniForum at (408) 986-8840.

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I am interested in a: ☐ 386 ☐ 486 ☐ Other ☐ Not Sure

How many applications will your PC(s) run in a typical workday? _____

How many PCs do you anticipate purchasing over the next 12 months? _____

Are you interested in leasing? ☐ Yes ☐ No

_____ Immediately; _____ 1-3 months; _____ 3-6 months; _____ 6-12 months

What best describes the type of work the system will be used for?

(Check all that apply)

- | | |
|---------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Word Processing | <input type="checkbox"/> Education |
| <input type="checkbox"/> Order-entry | <input type="checkbox"/> Design (CAD/CAM) |
| <input type="checkbox"/> Database (filing records) | <input type="checkbox"/> Engineering |
| <input type="checkbox"/> Financial Calculations | <input type="checkbox"/> Industrial Process Control |
| <input type="checkbox"/> Retail Store Management | <input type="checkbox"/> Scientific Research |
| <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Software Development |
| <input type="checkbox"/> Other industry-specific applications | <input type="checkbox"/> E-Mail |
- (please specify)

Which of these graphics-oriented applications best describes your needs?
(Check all that apply)

- | | |
|---------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Image Processing |
| <input type="checkbox"/> CAD/CAM | <input type="checkbox"/> AutoCad |
| <input type="checkbox"/> Realtime Modeling | <input type="checkbox"/> Business Graphics |
| <input type="checkbox"/> Animation | |

How many people work in your group, department or small business?

- | | |
|---------------------------------------|--------------------------------|
| <input type="checkbox"/> Less than 10 | <input type="checkbox"/> 20-35 |
| <input type="checkbox"/> 10-20 | <input type="checkbox"/> More |

Is your desktop operating system:

- | | |
|-------------------------------------------|--------------------------------|
| <input type="checkbox"/> DOS | <input type="checkbox"/> UNIX™ |
| <input type="checkbox"/> DOS with Windows | <input type="checkbox"/> VMS |
| <input type="checkbox"/> OS/2 | <input type="checkbox"/> Other |
| <input type="checkbox"/> MAC | |

LAN Communication

How many PCs do you have installed? _____

From how many manufacturers? _____

What kinds of connections does your PC(s) require? (Check all that apply)

- | |
|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Links with other PCs in the immediate surroundings |
| <input type="checkbox"/> Connection to the local area network (LAN) throughout a building |
| <input type="checkbox"/> A line to a host system in a remote location |

What kind of media (cable) is used in your LANs today? _____

What is the networking software now being used in your company? _____

What kind of host system will your PC communicate with?

- | | | |
|----------------------------------|------------------------------|--------------------------------|
| <input type="checkbox"/> Digital | <input type="checkbox"/> IBM | <input type="checkbox"/> Other |
|----------------------------------|------------------------------|--------------------------------|

What Kind of Service Do You Really Need?

- | | |
|---------------------------------------------------|--------------------------------------|
| <input type="checkbox"/> On-site Hardware Support | <input type="checkbox"/> Training |
| <input type="checkbox"/> Software Support | <input type="checkbox"/> FAX Hotline |
| <input type="checkbox"/> Telephone Support | |

How many of your users take portables on the road? _____

Do you currently have a service contract(s) for your PCs? How Many? _____

Does your service provider offer Multivendor support? ☐ Yes ☐ No

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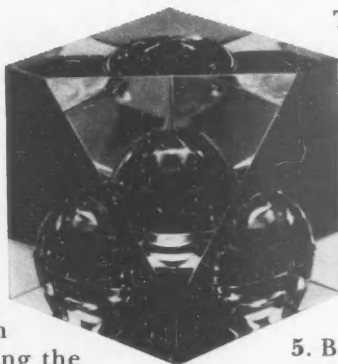
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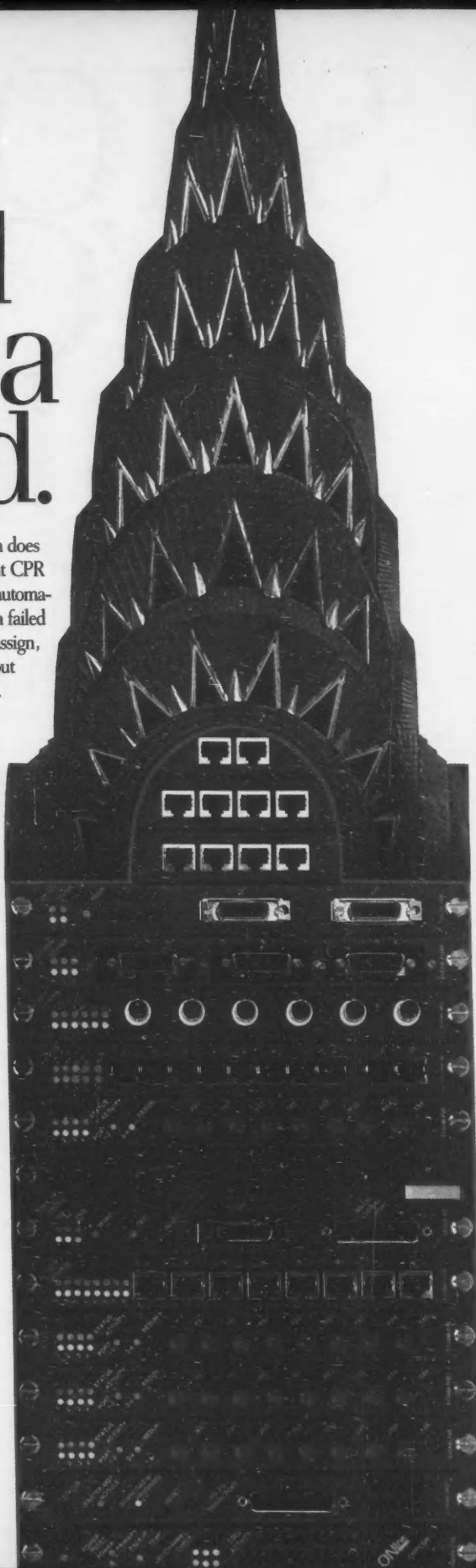


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IN DEPTH

Plugged in

Laptop work is only meaningful for business users if they can integrate it with desktop work. Here's one vision for meshing the two environments.

BY ANNE S. KELLERMAN
AND PALMER W. AGNEW

Isn't it great to hear users thank you for providing them with laptops to make their lives easier? These machines help certain business staff members to take notes during out-of-town meetings, schedule appointments or draft reports on an airplane.

Users just love them to death — until they get them back to the office and have to integrate the information on their laptop computer with information on their desktop machine or other devices.

The use of laptops in business is severely limited by a general lack of easy-to-use hardware and software for connecting laptops to other machines. Users get turned off by having to lug around and connect cables from their laptops to their desktop computers.

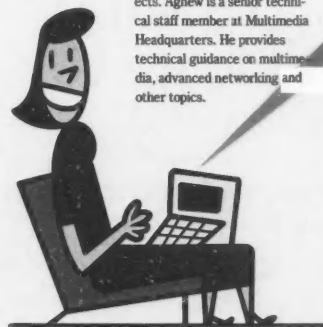
It is also unwieldy for them to transfer files back and forth one at a time between the laptop's hard drive or floppy disks and the desktop's hard drive. Trying to produce a consolidated list of appointments from laptop and desktop files typically means a lot of re-keying and file transfer.

Such obstacles tend to limit effective use of laptops to people who know a lot about computers and those who are willing to agonize over transfer, update and connection details.

Companies are in need of a complete sys-

Kellerman is a senior member at IBM Multimedia Headquarters in Endicott, N.Y. She handles special projects.

Agnew is a senior technical staff member at Multimedia Headquarters. He provides technical guidance on multimedia, advanced networking and other topics.



tem environment that would make it easy for laptop users to keep track of the information on their laptops and other machines, to share information with desktop and laptop users and to make good use of available devices such as printers, file servers and fax machines.

While there are ways to perform such functions today, they require a lot of custom software work and intercession by computer staff. What is missing is a sufficiently convenient, integrated and standardized hardware and software environment that will free users from worrying about how to connect and merge their information and let them concentrate on their work.

The following is a presentation of how such an environment might look. The key components for this integrated laptop environment are a standardized connection between a laptop to other computers and devices, file maintenance software for laptops and other computers and identification software for making computers and devices accessible to the user.

Connecting the laptop to other computers and devices.

Nothing makes a portable computer less portable than connecting it to a bunch of thick, dangling cables. Having only a single thin cable, either copper or fiber-optic, would be significantly better, especially if it retracted onto a spring-loaded reel inside the laptop when not in use. A wireless connection, either infrared or radio, would give the laptop user still more freedom.

Layering of communications systems ensures that a software system need not know or care whether a connection is wired (with copper or optical fiber) or wireless (with infrared or radio). What's more important is that a company's integrated laptop environment standardize on one of these communications media so that users can communicate no matter where they take their laptop computers.

Thin copper cables are less trouble than the thick, stiff cables most personal computers and laptops use. Fiber-optic cables, which use plastic or glass pipes to transmit light beams that carry information, can have very high bandwidth and be thinner and

stronger than most copper cables.

Infrared wireless connections, familiar from television and videocassette recorder remote control units, operate only within line of sight, such as in one room. Radio wireless communications can pass through some walls and have a longer range than infrared. The range of radio communications can be extended still farther by using cellular radio systems.

While each of these connection methods has its drawbacks (see story page 114), wireless connections have two desirable properties that may make them a solid choice for an integrated laptop environment. First, a wireless connection allows a laptop user to move around while remaining connected to other machines. Second, the short range of infrared communications enables walls and doors to stop an infrared signal. As a result, a laptop with an infrared connection can communicate with computers and other devices that are in the same room, without interfering with machines in other rooms.

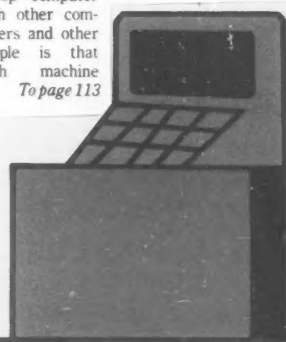
A wireless connection, whether infrared or radio, can be extended throughout a building or campus by means of a connection to a local-area network. It can also be extended to the rest of the world by means of a connection to a wide-area network.

Maintaining files on laptops and other computers.

Once the means of communications is set, efforts can move on to software. The most important requirement for interconnecting a laptop computer

with other computers and other people is that each machine

To page 113



J. D. King

- Comfort settings: Size, weight, memory, etc.
- What laptops will look like by '98
- Pros and cons of connection options



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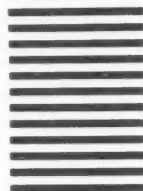
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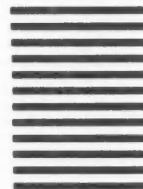
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Continued from page 111
gets all the files it needs.

What users need is improved file maintenance software, which automatically decides on and executes file transfers. This software can provide the end user with a single system image of files stored on the laptop, desktop and even host computers.

Such integrated software would obviate the need for laptop users to go through the onerous, repetitive and error-prone procedures for keeping track of separate sets of laptop and desktop files.

In general, a laptop may need to do three things when it is connected to the user's desktop computer, or even to a worldwide network of computers. It may need to merge certain laptop and desktop files, send some files to the desktop and receive other files from the desktop. With file management software, these functions can all work in reasonably simple ways, as follows:

■ First, there are some files that must be merged whenever possible. Appointment book files and address book files are primary examples of these kinds of files because a user updates them in the laptop when he's out of town. Meanwhile, back at the office, the user's secretary or colleagues are updating copies on the desktop systems there.

While personal organizer programs, which are intended to run on laptops, come with programs that merge such files with files used on the same or different programs on desktop computers, companies need a program to invoke the merge programs.

This invocation program would use a special index file set up by the user or by the user's computer support guru. The index file would specify the names of pairs of files to be merged, along with where the files are located on the laptop and desktop. For each such pair of files, the index file would also specify the name of the application program that performs the merges.

The user need not name the applica-

tion programs or the files each time they are merged. The merged files these application programs produce would replace the previously separate laptop and desktop files. The merge programs can run on the laptop or desktop.

■ Second, with the exception of files that were merged, every file that is present on the laptop must be transferred to the desktop, unless a desktop file exists with the same name and same or

later date as a laptop file.

In practice, this function needs file transfer software on both the laptop and the desktop and also needs a program that invokes the file transfers.

■ Third, particular files on the desktop

Furnishing data

In the next six years, the laptop is expected to evolve into a PICA, or personal information communications appliance, a powerful, easy-to-use computer embedded in furniture, mirrors or wherever the user wants it

Resembles a paperback book in size, weight and readability.

Battery life measured in months.

Chord keyboards, in which users press a few large buttons in combination for each letter, could reduce keyboard size.

Screen suitable for color motion video, perhaps initially in the form of a cheap, small, separate LCD screen. Screen would be touch-sensitive for selecting, sketching and handwriting recognition.

Multimedia capable.

Includes pager/receiver with file transfer capability and an optional wireless speakerphone and voice-mail facility.

Contains software for accessing and maintaining an internal database using built-in speaker.

Provides telecom access to users' private data as well as access to public data, integrated voice mail and electronic mail.

Communicates over high-speed fiber and other networks.

Has detachable CD-ROM drive. User could load the text of a book into the PICA's memory and then remove the device while reading the book, without carrying or powering the drive.

• Partial-page scanner built into one edge and an optional, noncontact bar-code scanner.

Provides speech, audio and music input and output as well as a built-in video camera for scanning text and recording scenery. By 1998, size will shrink to wallet size.

Source: Anne Kellerman, Palmer Agnew

CW Chart: Michael Siggitt

computer need to be transferred to the laptop, unless the laptop already has files with the same names and with same or later dates.

The user or an information systems support person needs to specify an index that lists these files. Appropriate formats already exist in programs that back up arbitrarily specified lists of files from hard file to floppy disks. Again, in addition to the file transfer programs, users need a program that reads the index list and invokes the file transfers.

The above three procedures should occur automatically in an integrated laptop environment.

For instance, suppose a user returns from a trip with a laptop computer full of notes, reports and new calendar entries. When the user connects the laptop to the desktop machine, the laptop should ask the user if the time is ripe for file management to occur. If the user answers, "Yes," then a program automatically merges laptop and desktop files, sends some files to the desktop and receives other desktop files.

When this process is complete, the user can be sure that calendars and so on have merged and are available on both machines, that all new files have been moved from the laptop to the desktop and that all desired new files, such as updates to software, have been copied from the desktop and are now available on the laptop for use on the next trip.

File maintenance software also helps with reading and answering electronic mail from a laptop.

The user or support person would need to make sure that the file containing unanswered mail is in the index of files to be transferred from the desktop to the laptop. Before leaving for a trip, the laptop user would make sure to run the file maintenance software, which would ensure that the laptop contained the file of unanswered mail.

While on the road, the user could read and answer his mail as well as create new mail. Software on the laptop would put the new, outbound messages in a separate

file. When the user next connected his laptop, the file maintenance software would move that new file to the desktop, where it would be available for transmission over the network.

Identifying accessible computers and devices.

Laptop users would benefit greatly from having integrated software that would provide them with a single image of all nearby computers, peripheral devices and users.

Like the proposed software that manages files, proposed software that identifies accessible computers and devices for the user could be implemented using either wireless or wired connection mechanisms. However, infrared connection works particularly well in this case.

With an infrared-equipped laptop, a user could enter a room full of infrared-equipped laptop computers, desktop computers, printers, fax machines and scanners and his laptop would "see" these other devices.

That's because all machines in the room would be exchanging identification signals with each other. These signals are sent out on a continuing basis, roughly once per minute, and contain a machine's unique address (the number by which the machine is known to the network). Machines would typically have a light-emitting diode or laser as a sender and a corresponding detector for signals.

The ID signal would also contain the device's physical location and additional information.

Continued on page 114

Personal experiences

All the connectivity and easy-to-use software in the world won't help if laptops aren't comfortable to use. Anne S. Kellerman and Palmer W. Agnew are longtime laptop users who offer these tips from their experience with small machines:

► **Size:** We've found that a keyboard that is 80% of the linear dimension of a desktop keyboard is usable for high-speed typing, but a keyboard that is 64% of full size is not.

► **Screen:** A screen that is not backlit allows battery life to exceed one month, but we found that such a screen is readable only if a good light source is located over the user's shoulder.

► **Memory:** Random-access memory cards the size of a credit card can store significant amounts of data in a small space, but their cost limits us to using them for only a small fraction of the data that we store on disks.

► **Weight:** We have found that a 4-pound portable lives in the user's desk and comes out only when definitely required; a 2-pound laptop lives in a briefcase and is available a lot of the time; and a 1-pound laptop or palmtop computer lives in a belt pouch or purse and is available nearly all the time.

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Continued from page 113

In the case of a printer, the additional information could contain its services, such as its available fonts, speeds, collating ability, whether it can print double-sided or in color and so on. The information could tell how busy it is and also offer directions on how to reach another, less busy output device.

Within about a minute of entering the room, a user's screen would display a single image of all portions of the system in range of a laptop computer's infrared connection mechanism.

This image would be translated to the user's screen as a "room" metaphor; that is, the user would see the graphical equivalent of the room he is in, with icons representing each machine in it. The screen would contain everything he would want to know about all of the resources available to him, including people who are using similarly equipped computers.

For example, he could print to a given printer by finding the icon that looks like it and dragging the icon representing the desired file over to the icon representing the desired printer. Or he could send a message or a file to a machine by dragging a message icon or file icon over to the icon representing that computer.

Automatic ID of resources could offer benefits beyond just a single user interacting with other devices, however. Imagine a user taking a laptop into a seminar or meeting room in which there were several people who had laptops. His laptop could be exchanging IDs with the other machines in the room, giving the user images of the other attendees' faces and business cards, which had been scanned in when they first got their laptop computers.

He might even receive a plan of the room he is in, which would show where each of the attendees was sitting. He could send a message to a particular person by selecting that person's face on the laptop screen. The laptop would use the icon he selected to determine the network ID of the person to whom he wants to send the message, wait for a free moment in the barrage of infrared being broadcast into the room and send the message.

The user could then run a check on whether anyone else started transmitting while the message was being sent and also make sure that the receiving laptop had acknowledged the message.

This environment would also enable a manager to broadcast copies of charts and graphs he is presenting to staff members. Meeting participants could take notes

during the session by annotating their copies of the visual materials, concentrating on taking down interesting or controversial highlights rather than capturing the basic material or rushing to record enough of the material from foils and flip charts to provide the context for notes.

The software should also make seminars or meetings more interactive. Individuals could transmit votes to questions posed by the speaker as well as send questions for the speaker to answer later or send messages to other attendees without disrupting the speaker or other attendees.

The "room" metaphor can significantly enhance group participation during most gatherings.

The improvements and functions that are described here could make the combi-

nation of laptop computers and desktop computers available to people who are not willing or able to concentrate on the many details that are required to use today's products.

Any of the connection mechanisms that have been described, particularly the wireless ones, would greatly increase user convenience and would open the laptop market to occupations for which carrying and manipulating cables is unacceptable.

The proposed software in this environment would create a single system image from the many files and computers that one person actually uses so that the user could concentrate on his work rather than concerning himself with which computer contains which function and which computer or peripheral device performs which function. •

A USER COULD enter a room full of infrared-equipped laptop computers, desktop computers, printers, fax machines and scanners and his laptop would "see" these other devices.

What you ought to know before buying that thick wire

The connection options that companies can use to create their integrated laptop/desktop environments each have their share of advantages and disadvantages.

The pros and cons listed below are in comparison to today's thick copper printer cable. All of the numbers are approximate; they vary with source and with individual design trade-offs, such as paying more to get faster speed:

THIN COPPER WIRE (telephone modular cable):

Advantages

- 6% of the weight.
- 60% of the cost.
- More flexible.

Disadvantages

- 16% of the speed.

FIBER-OPTIC CABLE (plastic fiber with LED transmitter):

Advantages

- 2% of the weight.
- 250 times higher speed.
- Very flexible.

Disadvantages

- Not standard.

WIRELESS INFRARED:

Advantages

- Easily identifies other machines in the same room.
- No cable so no weight, cost, stiffness.

Disadvantages

- Five times electronics' cost.
- 65% of the speed.

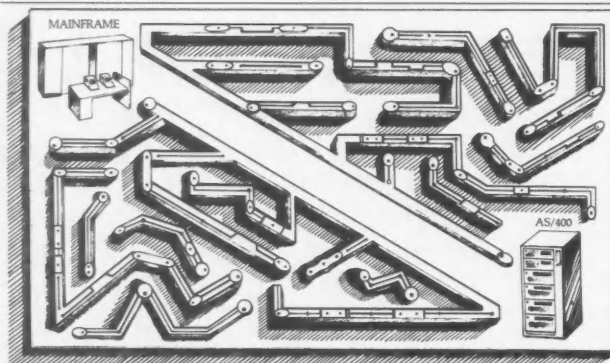
WIRELESS RADIO:

Advantages

- No cable, so no weight, cost or stiffness.

Disadvantages

- Eight times electronics' cost.
- 60% of the speed.



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Making the connection

A comparison of typical laptop connection media

Type of connection	Weight per 10 ft	Price per 10 ft	Price, hardware per end	Bit/sec.
Thick copper, printer cable	23 oz.	\$7	\$60	400K
Thin copper, phone modular cable	1.4 oz.	\$4	\$60	64K
Low-end fiber optic	0.5 oz.	\$3.05	\$60	100M
Wireless infrared	0 oz.	\$0	\$300	256K
Wireless radio	0 oz.	\$0	\$495	242K

- Prices are approximate and are for cards, quantity one, at retail.
- Weight per 10 ft and cost per 10 ft are for the connection itself with the necessary connectors but without electronics.
- Price of hardware per end is the hardware to send and receive information that must be included at each end of the cable, including the card.
- Bit/sec. is typical speed or bandwidth, not necessarily the highest that is practical within the state of the art.

Source: Anne Kellerman, Palmer Agency

CW Chart: Michael Siggins

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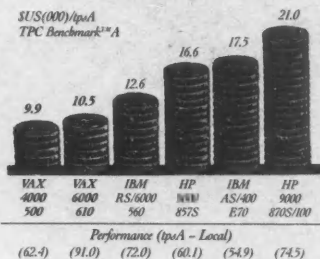
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MANAGER'S JOURNAL

EXECUTIVE TRACK



Deborah S. Decker, formerly an assistant regional commissioner for data process-

ing at the **Internal Revenue Service**, has been named the IRS assistant commissioner for taxpayer services in Washington, D.C.

Since 1989, Decker had been assistant regional commissioner for data processing for the Mid-Atlantic region, based in Philadelphia. In her new position, she will be responsible for all taxpayer service programs.

Decker joined the IRS in 1981 as a public affairs officer at the Cincinnati Service Center. She became chief of the processing division at the Philadelphia Service Center in 1985 and assistant director of the Service Center in Ogden, Utah, in 1988.

She holds a bachelor's and a master's degree as well as a Ph.D. from Indiana University.

The IRS also promoted **Walter H. Irvine** to director of the telecommunications division.

Irvine will be responsible for planning and implementing the IRS telecommunications systems to transmit voice, image, text and data. He joined the IRS in 1989 as assistant director of the telecommunications division.

He entered the federal government in 1986 as project manager for the General Services Administration's (GSA) huge Federal Telecommunications System 2000 communications contract. He later became director of the GSA's telecommunications customer requirements office.

Irvine holds a bachelor's degree from Williams College in Williamstown, Mass.

Robert J. Loeb was named director of management information services for **Will County** in Joliet, Ill.

Loeb previously headed Robert J. Loeb Management Consultants, a Chicago-based consulting firm. He holds a bachelor's degree from the University of Illinois at Chicago and an MBA from the University of Chicago.

Coral lipstick? It sells big in Florida

Quick crunching of point-of-sale, merchandiser reports vital to marketing decisions

INDUSTRY CLOSE-UP

IS in the Personal Care Industry

BY JULIA KING
SPECIAL TO CW

American consumers tend to buy new toothbrushes only when they see hundreds of them in special supermarket displays. Midwesterners prefer their shampoo in big bottles, but men and women on the East Coast consistently buy toiletries in smaller sizes. Coral shades of lipstick sell better in Florida than in the Northeast.

A decade ago, it would have taken months and hundreds of market researchers to pinpoint trends such as these. Today, buying patterns can be identified in a matter of days, thanks to the oceans of data now available from retailers' electronic point-of-sale (POS) systems and portable systems used by sales reps and merchandisers.

Manufacturers say the addition of frequent reports from merchandisers is a critical step because they indicate not only what is selling but why — something POS data alone does not do.

In the \$9 billion personal care industry, the ability to react swiftly to these patterns makes or breaks its bottom line. That's why many companies are automating the way they track and analyze retail sales data, which in turn is driving promotional programs for everything from soap to shaving cream.

High-tech homework

Cincinnati-based Procter & Gamble Co. (P&G) — through the use of some homegrown systems as well as Metaphor Computer Systems, Inc. database software, Toshiba Corp. portables and

a Teradata Corp. database system — collects and analyzes retail sales data, says Frank Caccamo, P&G's chief information officer. This information is then used by marketing to target specific groups of consumers.

For example, by analyzing scanner-based consumer data, P&G was able to pinpoint older women as the most loyal customers of the company's Oil of Olay product line, Caccamo says. To attract new buyers, P&G launched an advertising campaign geared specifically to teenagers and young women.

Thanks to daily reports sent to headquarters by laptop-toting salespeople, P&G's marketing unit can also now see the effects of pricing and marketing activity in a matter of days or weeks as opposed to months, he says.

Before P&G implemented the laptop systems four years ago, it received sales data from A. C. Nielsen Corp. and Information Resources, Inc. every two

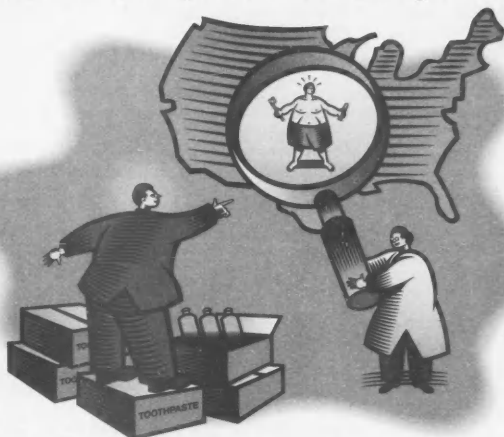
months. Now, "we get all of the data for any given week at the end of that week," Caccamo says.

The tracking system furnishes invaluable marketing intelligence, Caccamo says. "It helps us to better understand regional differences in buying habits," he says. (It was P&G, in fact, that established Midwesterners' preference for jumbo sizes.)

During the past winter, for example, P&G analyzed weekly retail data in conjunction with regional weather patterns to measure how weather effects sales of its Vick's Formula 44 and Nyquil cold products.

"By looking at the data weekly, we can see the effects the cough/cold and flu seasons have on our products," Caccamo says. "Seeing that, we can then put in place appropriate consumer response programs." These programs, he says, might include special sales or

Continued on page 118



Peter Hoey

CIOs find balance at Andersen seminar

BY NELL MARGOLIS
CW STAFF

In 1986, when Andersen Consulting launched a series of annual chief information officer workshops to address the key issues confronting corporate information systems leaders, technology trends took center stage. Now, hot technology has moved to sideshow status: Some 125 IS leaders flocked to Andersen's eighth annual confabulation held in St. Charles, Ill., recently to mull over IS' role in the business mix.

Jim Hine, deputy administrator of the Austin-based Texas Employment Commission, said he attended the workshop "primarily to get the benefit

of peer communication," and he got it.

Perhaps most critically, Hine said, he gained peer and consultant support for a premise to which he already subscribed: "The real key to successful integration of technology into an overall business is balance."

And not just balance between IS and a firm's core business, he added, but also, quite significantly, "balance between strategic plans and action plans."

The need to distinguish between a game plan and a game was stressed by keynote speaker Peter Keen, director of the International Center for Information Technologies.

His own shop, Hine said, helped fuel Texas to leadership status in job placement with the likes of computerized

job/applicant matching. Now, understaffed and facing a future of flat revenue at best, he said, the department is looking to use technology to address its most pressing need: "We have to get [unemployed] people out of our offices, into an active job search."

Voice response and expert systems, one of which is already at work guiding applicants through disaster relief claims, rank high among the possible best bets, Hines said.

However, no alternatives will work, he noted, if none are tried. "This might seem like an obvious point," he said, "but it's amazing how often it tends to get lost." The dangers of haring ahead without a road map and goals, he said, often pale beside that of getting trapped in an endless round of meetings, reports and initiatives, with no effectuation in sight.



Coral lipstick? Big in Florida

CONTINUED FROM PAGE 117

coupon giveaways in cold regions.

New York-based Colgate-Palmolive Co. also has equipped its sales force with laptop computers to transmit retail sales and merchandising information to corporate headquarters. This data is now received every day rather than every two weeks, enabling the company to quickly activate special marketing programs around proven sales trends.

If, for example, Mennen deodorant is selling well at stores where an end-of-aisle display has been set up, Colgate can arrange to duplicate the displays in other stores, says Mark Finn, manager of sales

information and technology.

The Gillette Co. in Boston is piloting a system that will do away with paper-based reports. Under the program, Gillette merchandisers — company employees who maintain store displays — file daily display status reports using Grid Systems Corp. portable pen-based computers that run software from Atlanta-based Sales Technologies, Inc. A merchandiser's report, for instance, can note that sales of a certain brand of shampoo or bath oil are particularly brisk at stores where special displays have been erected or where coupons are available.

This data is given to account managers, who can set merchandising and promotional objectives based on specific accounts. Objectives may include setting up more displays or changing display items.

"These objectives used to be typed up by managers, sent to a central office and mailed to all merchandisers, who would then file them in their folders with all of their other papers," says Ted Standish, director of information systems at Gillette's North Atlantic Group. "Needless to say, the process frequently broke down and was fairly ineffective," he adds.

For example, managers would sometimes fail to set objectives, so merchandisers would not have the information they needed to do their jobs. "Most importantly," Standish says, "Gillette didn't have

information about the execution and effects of our display programs." The company wouldn't find out if a display had been set up and was effective until long after a promotion was over, he says.

Now, by contrast, Standish says, the data that previously took 6 to 12 weeks to get back is transmitted by merchandisers nightly and is available to account managers on a weekly basis.

Can't live by automation alone

Automation alone, however, does little to guarantee sales and marketing success. In addition to technology, analysts and manufacturers agree that organizational changes are necessary if the new automated methods are to yield true benefits.

"While data in itself is incredibly powerful, an organization must be set up to respond to that data in a timely fashion," notes Dan Bartholomew, a manager at CSC Partners, a Philadelphia-based consulting firm. "There is a whole raft of decision-making that must take place very quickly," Bartholomew says. "As a result, teams must have the latitude to mobilize an entire organization, from manufactur-



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Sales data about products such as Sensor razors helps Gillette decide whether to set up displays to entice buyers

ing to distribution."

P&G has tackled the organizational issue by creating IS posts across all company sectors, such as the health and beauty aid areas, and also within each functional department, such as marketing or sales. "The real strength of the management systems division is that our organization is both highly distributed and tightly controlled," Caccamo says.

At Colgate-Palmolive, the organization that Finn heads was created as part of a larger effort to automate the retrieval of sales data. The group exists separately from the firm's corporate IS department and has responsibility for Colgate-Palmolive's sales force automation effort.

At Gillette, Standish says he is planning to designate special IS "S.W.A.T." teams whose members will work directly with the company's marketing department. "Right now, users [in marketing] aren't 100% sure of what statistics and reports might be most useful," Standish says. The job of the S.W.A.T. teams will be to help them define these reporting and analysis needs, then execute these requirements quickly.

King is a free-lance technology writer based in Ridley Park, Pa.

Nolan, Norton yardstick shows IS where it stands

BY NELL MARGOLIS
CW STAFF

LEXINGTON, Mass.— Information systems departments in search of increased effectiveness and efficiency should heed the example of former New York City Mayor Ed Koch, according to management consulting firm Nolan, Norton & Co.: At every opportunity ask, "How'm I doin'?"

Nolan, Norton's Database Center Baseline Program attempts to answer that question by measuring and analyzing annual changes in IS demographics, work loads, service levels and technology costs.

The program, launched in 1986, uses information culled from a database of broad-based statistics supplied by more than 100 firms.

The 1991 baseline study results, released at a conference late last month in Waltham, Mass., showed "trimming and tightening across the board," said Nolan Norton consultant Hildy Brand.

Other key findings, she said, include the following:

- Decreased staffing across all organizational functions, particularly in operations support, management and planning.

- A substantial decline in the level of manually intensive activities, as gauged by reductions in tape mounts and print volumes.



- A modest decrease in total data center spending, driven by reductions in personnel and technology spending.

No surprises here, conceded Nolan, Norton principal David McKay.

"You have to know where you are before you can figure out where you ought to go," McKay said. Benefits derived from plotting your firm's IS progress against that of similarly situated firms on a yearly basis, he noted, "can be as limited as a feeling of comfort between the IS director and the [company's] CEO." At the other end of the spectrum, however, such metrics "become the driving-off point for major strategies" — for instance, consolidation or outsourcing.

McKay recalled one client who used baseline data to cut a better deal. Two leading outsourcing vendors were quoting 15% overall IS cost reductions, but the data showed that that quote left between \$350 million and \$400 million in possible reductions on the table. The client went back and renegotiated the deal with both vendors, McKay said, and ended up with a savings commitment more than twice that originally offered.

CALENDAR

JUNE 28-JULY 4

Database World. Boston, June 29-July 1 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

JULY 5-11

Informix Worldwide Users Conference. San Jose, Calif., July 8-10 — Contact: Jay Prosser, Informix Public Relations Group, Menlo Park, Calif. (415) 926-6316.

IS Financial Management Annual Conference. San Francisco, July 8-10 — Contact: Terence Quinlan, Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

JULY 19-25

QuarkXPress Users Conference. New York, July 22-23 — Contact: QUI, Salem, N.H. (603) 898-2822.

JULY 26-AUG. 1

The Managing Enterprise Networks Conference. Boston, July 27-29 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

PC/Canada. Toronto, July 28-30 — Contact: The Interface Group, Needham, Mass. (617) 449-8938.

AUG. 2-8

Fed Micro '92. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Fuse CD-ROM and Multimedia Conference & Exposition. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

AUG. 23-29

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

SEPT. 20-26

Image World. New York, Sept. 21-25 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc. (914) 328-9157.

Virtual Reality '92. Westport, Conn. Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

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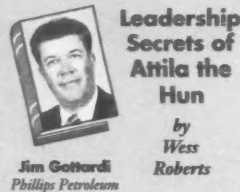
COMPUTER CAREERS

The private bookshelves of IS managers

BY LESLIE GOFF
SPECIAL TO CW

What do successful information systems managers read to recharge their batteries and fire up their imagination? Some pretty surprising things, actually. A couple of the current favorites, for example, concern a nomadic Mongolian leader and a failed Antarctic explorer.

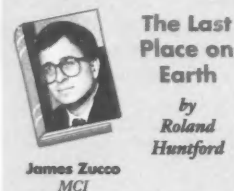
Leadership Secrets of Attila the Hun by Wess Roberts (Warner Books, Inc., 1989) was "a fascinating book" to Jim Gottardi, manager of applications services at Phillips Petroleum Co. in Bartlesville, Okla.



The book, in telling the story of Attila the Hun, offers information on what is required to motivate and move a large organization in a specific direction, Gottardi says.

"Attila was such a successful leader during a time when communication was extremely difficult," Gottardi says. "He wasn't a popular person, but he was eminently successful in his mission to conquer and expand his sphere of influence."

The South Pole might just be *The Last Place on Earth* that most IS people would go for sound management advice, but the book, by Roland Huntford (Atheneum, 1985), was "the best management book I ever read," says James Zucco, senior vice president of IS at MCI Communications Corp. in



Washington, D.C.

The book recounts the race between explorers Roald Amundsen and Robert F. Scott to reach the South Pole. Both men were highly experienced explorers who had access to comparable resources, Zucco says, but while Amundsen carefully planned his trip and trained his people, Scott turned the trip into more of a media affair. Predictably, Amund-

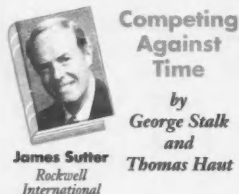
sen won the race. Scott lost a number of men en route and froze to death 165 miles short of the South Pole.



Zucco says he sees similar stories in the IS world from time to time. "These days a lot of people in IS talk about strategic advantage," he says, "but very few actually execute their visions, and success is in the execution. That's important in IS. Achieving excellence lies in hard work."

However, not every IS manager derives inspiration in such far-flung subjects: Most read books that target workplace and organizational issues a bit more. One in particular — *The Fifth Discipline: The art and practice of the learning organization* by Peter M. Senge (Doubleday, 1990) — stands out to some executives.

The title refers to what the author calls "systems thinking" — that indi-



vidual learning doesn't contribute to the organization as a whole and that companies must become "learning organizations" to stay ahead.

"It's not a cookbook," says Tom Gildea, vice president of business information services at Helene Curtis Industries, Inc. in Chicago, which is working with Senge's consulting firm. "The ideas are broad and insightful."

For instance, Senge writes about the "seven learning disabilities" that every organization faces, including the parable of the boiled frog. As the story goes, if you put a frog in boiling water, it will jump out. But if you put it in cool water and slowly bring it to a boil, the frog will get cooked because it doesn't notice the heat of the water gradually increasing.

In the same way, little things happen in IS on a day-to-day basis that may not get noticed but that ultimately lead to the success or failure of the business, Gildea explains. "In IS, this book has helped us get a good start on our total quality management pro-

gram. It imparts skills that let the organization grow, learn, improve and create. Part of the basic philosophy of TQM is learning and institutionalizing that learning," he says.

The Fifth Discipline also appeared on the reading list of James Sutter, vice president of IS at Rockwell International Corp. in Seal Beach, Calif. Sutter has taken the book's "learning organizations" concept into account by spending "more time looking at computer-based learning systems as a way of providing learning experiences across groups of people rather than individuals," he says.

Sutter says he also was influenced by the book *Competing Against Time: How time-based competition is reshap-*



ing global markets, by George Stalk and Thomas Haut (The Free Press, 1990), which discusses ways that companies can reduce cycle times and improve their time to market. The book's philosophies came into play when Rockwell extended its engineering network across Europe and the U.S. to maximize data and software sharing and to enable geographically dispersed teams to work on the same projects concurrently.

"The book also has had influence with respect to delivering our own internal software to users more rapidly. Our software development people are now more inclined to make full use of the tools and methodologies available to them," Sutter says.

IS managers are also reading



books that will help keep them and their departments on the cutting edge. For instance, Bob Martin, executive vice president of IS at Wal-Mart Stores, Inc. in Bentonville, Ark., has kept up to snuff by applying what he learned from reading *The Customer Driven Company* by Richard Whitely (Addison-Wesley Publishing Co., 1991). The book outlines a customer-focused marketing and service strat-

egy based on simplifying business processes and applying Japanese business principles. And Sid Diamond, vice president of IS at Black & Decker Corp. in Towson, Md., has applied strategies for understanding customer needs and expectations that he read in *Keeping Customers for Life* by Donald Caplin and Joan K. Cannie (Amacom, 1990).

"We're looking at ways of providing information to our customer base and at things that will be helpful to them," Diamond says. "We're trying to find ways that will help them use our services and deal with the company, asking ourselves, 'What information do they need from us to help manage their business?'"

Darlane Hoffman, vice president of telecommunications at Metropolitan Life Insurance Co. in New York, has absorbed applicable insight from the books she reads for pleasure. For instance, *2020 Vision* by Stan Davis and Bill Davidson (Simon & Schuster, 1991), which she describes as "very visionary," looks at the merger of computer systems and telecommunications systems and predicts that while they "may be synonymous today, they will become ever more so," she says.

"It can be likened to the evolution of voice capabilities," Hoffman adds.



"We've just come to expect that we can call anyone, anywhere, anytime and have a conversation. The authors say we really need that same connectability to all the data sources available — to be able to access time-sensitive data in a real-time way."

No matter what they read, IS managers seem to see books as a key way of dealing with the onslaught of trends that confront them in the office. Take Martin, who is reading *Breaking with Tradition, Women and Work: The new facts of life* by Felice Schwartz (Warner Books, Inc., 1992).

"It's more of a management book about dealing with the growth and development of high-achieving women," he says. "Every employer today has to be conscious of bringing up good talent in a shrinking work force."

"IS has a high percentage of women," Martin adds. "We try to do a lot to accommodate working women to give them career equality and enable them to fulfill other ambitions."

Goff is New York-based free-lance writer.

Moving on can mean moving up

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Steve B. Fogle, regional director at the San Francisco office of the Alexander Group, a Houston-based executive search firm.

Q I have been in an upwardly mobile career track in applications development and have received numerous calls from executive search firms as well as peers asking me to make a job change. In these uncertain times, should I make a job move?

A Sometimes we don't progress to the next management position or the next compensation level unless we make a job change. Although I recognize job security as being very important, sometimes a job move is the only way to continue to be challenged and stimulated.

When thinking about a job change, consider the company's performance (if a public company, check with your stock analyst), the industry's performance and the history of the department you will be joining. Ask for company references such as customers and former employees.

I would also recommend that you meet with someone in a department outside of information systems, such as marketing, sales or manufacturing, to learn as much about the company as possible.

Q My background consists entirely of IBM mainframe applications develop-

ment. Although I am challenged by mainframe development, should I gain some additional experience in the personal computer area?

A Mainframe applications development programmers are still in high demand. I would recommend that you remain on this track but gain some PC experience, possibly in using computer-aided software engineering tools and in local-area network development.

FAST TRACK CAREER ADVICE FOR THE '90s

Q My position has been consolidated out of existence, and in six months, I have had no success in finding another management situation. I would like to get back into mainframe/midrange programming, but I need to rehabilitate my programming/job control language skills.

A I am 55 years old and have worked as an analyst/programmer for the last 12 months. Do you have any suggestions?

A There are various schools that would give you some additional programming experience, including independent computer learning centers and

universities.

I would also recommend you contact colleagues you have met over the years in IS and capitalize on those relationships to try to land a new management or programming job.

Q I am a recent college graduate with a degree in computer programming for business applications. I never see advertised positions for anything but experienced programmers. How do I get a job with no previous experience?

A I recommend you identify 25 companies you would like to work for and make calls to their human resources and IS managers to ask for informational interviews. During this process, you may find someone who would be willing to give you an entry-level position or an organization that has an internal training program. Many large organizations do have such programs for entry-level individuals.

I would also watch trade journals or newspapers to find out about other training programs offered by community colleges, adult education programs or sponsored by local firms.

✉ We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522 or send them by fax to Kelly Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.

TIP of the MONTH

What do you do when you've been asked to work on a project that's badly conceived?

At our company, we feel it's our responsibility to review the project concepts with the individual championing the project before we even begin the actual work. If we detect problems, we marshal our arguments and fight until a decision is made.

*Michael G. Barnes, director of technical services
Atlantic Electric Co.
Pleasantville, N.J.*

Negotiate the politics by recommending that the big project be segmented into smaller pieces, one of which can be tried as a pilot. If that pilot is successful, go ahead with the project.

*Harold A. Sample, data processing manager
Amerada Hess Corp.
Jackson, Miss.*



If you are in the midst of a project and flaws become evident, you have several responsibilities: Recognize the problem, assess how to fix it and face up to management. With a fatally flawed project, it may be best to start over.

*Joel L. Hartman, associate provost
for information technologies and resources
Bradley University
Peoria, Ill.*

Most people are not threatened by our input; they usually appreciate the ability to spot and fix problems up front. It doesn't matter whose ego is at stake. If something's wrong, we fix it.

*Timothy A. Kenney, independent consultant
Santa Barbara, Calif.*

Resolve problems before starting the project — that makes implementation easier. You must be honest about the project's limitations and expected outcome.

*Jim Durham, assistant data processing manager
Virco Manufacturing Corp.
Conway, Ark.*

Compiled by Jill Vitiello, a speech and free-lance writer based in East Brunswick, N.J.

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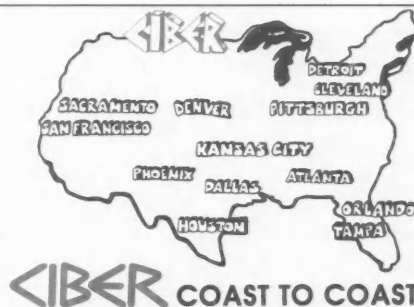
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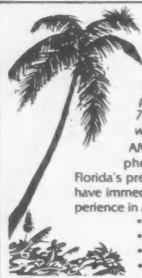
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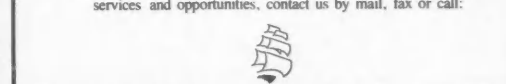
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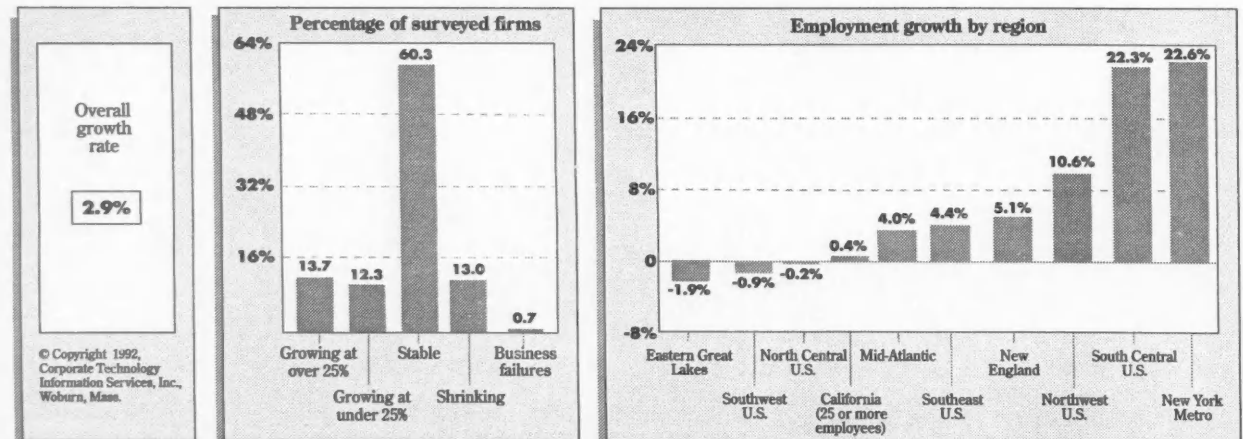
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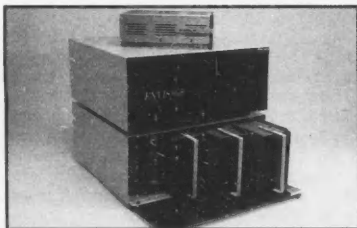
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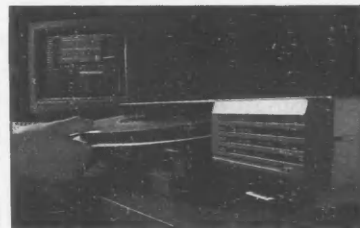
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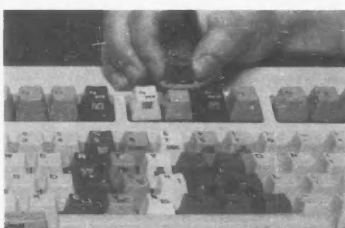


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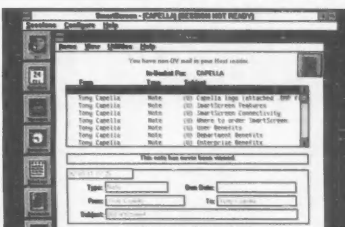
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MARKETPLACE

Leading brand not only choice

BY ALAN RADDING
SPECIAL TO CW

You don't need to buy industry-leading products to get cost-effective software that does the job. Instead, many organizations opt for lesser known or second-tier products that have most or sometimes all of the functionality of the leading brands with some appealing features of their own.

Robert Moskowitz, president of Crown Communications Systems, a business software consultancy in Woodland Hills, Calif., says devotees of these lesser known products are attracted by certain unique characteristics, such as the use of native ASCII file formats and the overall cost, which tends to be less, both in terms of the software and the hardware platform required. Personal preference and an original investment in the product in terms of user training, data and applications also play a role.

Respectable programs that garner good reviews and loyal followings but lack the name recognition can be found in all software categories, including the personal computer database and spreadsheet arenas, where the variety of products and the competition among vendors are immense.

In the PC database category,

Corporate Software, Inc., a Canton, Mass.-based distributor of software in the corporate market and publisher of *The Corporate Software Guide*, identifies Borland International, Inc.'s Paradox and dBase as well as Symantec Corp.'s Q&A as category leaders.

Lesser known products include the following: PC-File from Bellevue, Wash.-based Button-

ware, Inc.; Nutshell Plus II from Chico, Calif.-based Iris Software, Inc.; and Alpha Four from Alpha Software Corp. in Burlington, Mass., says Keith Mackenzie, senior technical support representative and database analyst.

The adoption of a nonleading PC database product often comes by way of a developer who is familiar with the product, Mackenzie says. Because organizations build applications on top of their PC database software, they are unlikely to switch products, he explains.

For others, simplicity is key. For example, the indirect lending department of the First Alabama Bank in Birmingham, Ala., standardized on Buttonware's PC-File because of its ease of use. Greg Lee, First Alabama's vice president, found he could easily write programs with PC-File because of its screen painting facility and flexible report writer. "They're not the prettiest or most

efficient programs, but they get the job done," he says.

By comparison, while dBase is a powerful database management system, its full programming language is best left to experienced programmers.

"When we told corporate we wanted a database, they sent over dBase along with a book just on how to read the manual," Lee recalls.

Another fan of simplicity is the technical support group at Nielsen Media Research in New York, which standardized on Alpha Four, according to manager Bob McCarney. "It's not a programming language, but it has a scripting language I can use to automate processes," he says.

Although the company has dBase and Fox Software, Inc.'s FoxPro installed, McCarney says he prefers Alpha Four because it is a menu-driven relational database geared to nonprogrammers.

In general, lesser known products in this category tend to be less expensive, with a few exceptions. Paradox and dBase list for \$725 and \$695, respectively, with Q&A priced at \$399.

In the lower tier, Alpha Four comes in at \$549, with PC-File selling for \$150 and Nutshell Plus II for \$395.

Spreadsheet values

For spreadsheets, the top echelon on the basis of market share is made up of Lotus Development Corp.'s Lotus 1-2-3 and Microsoft Corp.'s Excel, Corporate Soft-

ware analyst JoAnne Donohoe says. Borland's Quattro Pro, Computer Associates International, Inc.'s CA-SuperCalc and Informix Software, Inc.'s Wingz fall just below them.

Some users of lesser known spreadsheets don't miss the name brand products, however. "We're a big number-crunching shop. The leading spreadsheets [Excel and 1-2-3] beat SuperCalc in the way they look with WYSIWYG and a prettier interface, but SuperCalc is a great number cruncher with excellent linking," says Thomas George, accounting systems analyst at Northeast Utilities in Berlin, Conn.

George's group assembles a giant spreadsheet using links to 30 to 40 spreadsheets. The users have had SuperCalc since its early releases, and each release gets better. "Release 5 with linking has solidified us behind SuperCalc. It's a lot more powerful than its competitors."

The company also likes SuperCalc's hardware flexibility. It loads in 640K bytes of memory, thereby running on most computers — even old Intel Corp. 8088-based PCs.

Price is right

The price of the lesser known spreadsheets is also appealing. "Quattro Pro has an unbeatable price," notes Paul Jones, second vice president of information management systems at The Acacia Group in Washington, D.C. Normally listing at \$495, Borland regularly offers Quattro Pro for \$99. SuperCalc is also pretty inexpensive, costing \$149.

Some vendors, such as Computer Associates, also offer site licensing agreements to sweeten the deal, says Jeff Tarter, publisher of "The SoftLetter" in Watertown, Mass.

Radding is a free-lance writer based in Newton, Mass.



Wary is wise

There can be a downside to second-tier products. One major problem is finding enough information about the product and the vendor to make an informed decision. It is also possible to get saddled with an unsupported or discontinued product if a smaller or weaker vendor suffers financial problems.

Therefore, you should ask the following questions before purchasing a lesser known product:

- Does it support common data file formats?
- What is the availability of third-party support such as training, application development and documentation?
- What is the vendor's financial strategy?
- What is the vendor's upgrade strategy?
- What is the availability and quality of technical support?

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The BoCoEx index on used computers

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	Closing price	Ask	Bid
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AT Model 099	\$400	\$525	\$150
AT Model 239	\$550	\$650	\$175
AT Model 339	\$600	\$700	\$250
PS/2 Model 30 286	\$650	\$900	\$300
PS/2 Model 60	\$700	\$900	\$325
PS/2 Model 80	\$2,050	\$2,100	\$1,100
PS/2 Model 95	\$4,200	\$4,600	\$3,300
Compaq Portable II	\$450	\$500	\$375
Portable 286	\$600	\$800	\$250
Portable 386	\$2,000	\$2,125	\$1,000
SLT 286	\$700	\$900	\$400
LTE 286	\$900	\$1,100	\$500
Deskpro 286E	\$600	\$1,000	\$325
Deskpro 386/20	\$1,800	\$2,000	\$1,100
Apple Macintosh Plus	\$600	\$750	\$475
SE	\$850	\$1,050	\$650
IIX	\$2,800	\$3,250	\$2,000
IICI	\$3,200	\$3,600	\$2,460
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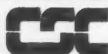
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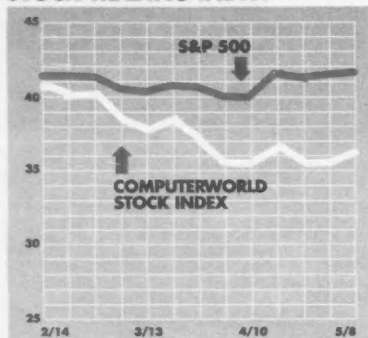
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Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, MAY 8, 1992

STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGES

DOWNGRADED FROM BUY TO NEUTRAL: BMC Software, Inc. (Alex. Brown & Sons, Inc.). A top supplier of IBM DB2 and IMS database enhancement products, BMC Software (BMCs) saw license revenue grow about 31% in its most recent quarter, which is below the 40% levels of the past two years. Although BMC Software continues to be a solid mainframe software vendor, its share price will probably fall in the near term after it reveals its restated fiscal 1992 financials. The company must revise previous quarterly reports to comply with new accounting rules governing software maintenance revenue.

DOWNGRADED FROM BUY TO HOLD: Silicon Graphics, Inc. (Prudential Securities, Inc.). Uncertainty surrounds Silicon Graphics' (SGI) proposed merger with Mips Computer Systems, Inc. (MIPS). Although Silicon Graphics reported a strong quarter, the same period was disappointing for MIPS.

Demand for Silicon Graphics' low-end Indigo series workstations and servers was hot, bringing in higher sales and margins than expected. The weak economy probably affected the company's high-end lines: the Crimson and Power series. However, Crimson is a promising product family, with shipments of 350 units expected in the current quarter.

Mips, meanwhile, saw orders sink far below normal weak seasonality as users deferred purchases in anticipation of the merger. The depressed revenues will likely continue for the next several quarters while the partnership unfolds.

UPGRADED FROM HOLD TO BUY: Cadence Design Systems, Inc. (Mabon Securities Corp.). The company appears to have successfully integrated personnel from recently acquired Valid Logic Systems, Inc. A leading company in the market for technical software to help design computer hardware, Cadence (CDN) reported slightly better-than-expected first-quarter earnings. Business picked up in March after weak showings in January and February.

Investors would do well to buy shares in this well-managed company. The near-term target price for Cadence stock is \$30.

KIM S. NASH

TOP PERCENT GAINERS

Merisel	30.59
Tandon Corp.	22.76
EMC Corp.	22.33
Corporate Software	18.92
Wetzel	18.75
Rexson Inc.	15.92
AST Research Inc.*	13.53
Dataram Corp.	13.39

TOP DOLLAR GAINERS

ITT Corp.	3.88
Parametric Technology	3.25
Adobe Systems Inc.	3.25
Merisel	3.25
Eastat Corp.	3.13
Chippm Corp.	2.88
Intelligent Info. Systems	2.88
EMC Corp.	2.88

TOP PERCENT LOSERS

Fibronix Int'l Inc. (L)	-18.00
American Software Inc.	-17.19
Imagica Corp.	-15.15
Storage Technology*	-13.77
Spinnaker Software	-13.16
Archiver Corp.	-12.33
Apertus Technologies	-10.37
Wellfleet Communications	-10.14

TOP DOLLAR LOSERS

Storage Technology*	-4.25
EMC Software Inc.	-3.25
Wellfleet Communications	-3.50
Northern Telecom Ltd.*	-2.88
American Software Inc.	-2.75
Symantec Corp.	-2.38
Exabyte	-2.38
Xerox Corp.	-2.25

Communications and Network Services Up 1.13%

Exch	52-Week	Range	May 8	Close	Wk Pct	Change
QTC	15.00	6.75	3 COM Corp.*	11.88	0.88	7.95
NYS	55.75	55.75	AT&T	62.63	-0.03	-0.09
NYS	44.00	32.88	Arnet Communication Corp. (L)	43.50	0.50	1.16
QTC	4.25	1.13	Ball Atlantic Corp.	42.25	-0.13	-0.09
NYS	50.63	40.25	Bell Atlantic Corp.	43.50	-0.88	-1.97
NYS	52.63	43.38	Bellsouth Corp.	48.75	-0.25	-0.51
NYS	9.38	4.75	Bit, Beranek & Newman	5.38	-0.38	-4.52
NYS	65.88	50.25	Cabletron Systems	40.88	0.75	1.91
QTC	31.00	11.75	Chippm Corp.	24.63	-2.88	-13.22
QTC	43.63	13.88	Cisco Systems Inc.	38.75	1.88	5.08
NYS	35.25	13.75	Combridge Labs Inc.	-0.63	0.10	1.16
QTC	4.63	1.25	Data Switch Corp. (L)	1.50	-0.06	-4.03
NYS	23.63	12.38	Digital Comm. Assoc.*	19.75	1.00	5.33
QTC	10.88	4.50	Digital Systems Int'l Inc.	11.50	0.25	2.22
QTC	37.50	13.50	Flanet Corp.	4.63	-0.19	-3.91
QTC	8.88	3.63	Fibronix Int'l Inc. (L)	5.13	-1.13	-18.00
QTC	3.63	1.13	General Datacomm Inc.	2.38	0.25	11.76
QTC	2.50	1.19	Gateway Communications	1.75	0.06	3.67
ASE	5.88	0.50	General Datacomm Inds.	4.25	0.38	9.68
NYS	35.00	28.13	Go Video	3.50	0.00	0.00
QTC	36.13	25.25	GTE Corp.*	32.25	-0.63	-1.91
QTC	14.50	5.75	ITT Corp.	32.63	-0.50	-1.50
NYS	29.25	7.88	Microcom Inc.	11.25	0.50	4.65
QTC	25.50	6.75	Network Equipment Tech.*	20.50	1.25	6.49
QTC	20.00	8.50	Network Systems Corp. (L)	10.00	-0.25	-2.44
NYS	49.25	35.00	Network Technology Inc.	29.75	1.75	6.25
NYS	49.25	35.00	Northern Telecom Ltd.*	38.00	-2.88	-7.03
QTC	65.00	22.63	Novell Inc.*	52.38	-1.63	-3.01
NYS	38.88	32.88	Nyx Corp.*	77.00	-0.13	-0.16
QTC	37.50	16.50	OcTel Communications Corp.	24.25	0.75	3.19
QTC	9.88	5.63	Penn Data Comm. Ntwks.	5.88	-0.63	-9.62
QTC	53.00	20.50	Proton Inc.	38.75	1.75	4.73
QTC	18.75	9.75	Proton Inc.	13.50	1.38	11.34
NYS	19.75	11.63	Scientific Atlanta Inc.	16.75	0.25	1.52
NYS	49.00	49.00	Southwest Bell Corp.	40.88	-0.13	-0.42
NYS	31.50	20.75	Sprint Corp.	24.50	0.50	2.08
QTC	42.25	14.25	Synopsis Communications	25.13	2.38	10.44
QTC	41.25	21.25	US West Inc.	35.63	0.00	0.00
QTC	41.25	21.25	Wellfleet Communications	31.00	-3.50	-10.14

PC Workstations Up 4.61%

QTC	15.75	5.75	Advanced Logic Research	7.25	0.25	3.57
QTC	70.00	20.25	Apple Computer Inc.*	62.00	2.75	4.64
NYS	22.25	14.50	AST Research Inc.	18.88	-0.13	-0.62
NYS	19.25	10.13	Commodore Int'l.	12.13	0.00	0.00
NYS	52.00	22.13	Compaq Computer Corp.*	25.13	1.88	8.00
QTC	27.75	13.50	Everett Computer Corp.	25.00	0.00	0.00
NYS	34.00	21.25	Everett Systems Inc.	5.88	0.00	0.00
NYS	85.00	44.63	Hewlett-Packard Co.*	28.13	-0.63	-2.17
QTC	18.63	7.38	Mips Computer Systems (L)	80.63	0.75	0.94
NYS	29.75	13.25	Silicon Graphics	9.13	0.88	10.61
QTC	38.00	20.75	Sun Microsystems Inc.	18.00	1.13	6.67
NYS	34.38	23.38	Tandy Corp.	29.75	1.75	6.25
NYS	11.75	5.13	Trend Electronics	28.25	0.38	1.35
QTC	25.50	9.00	Zeos International Ltd.	8.13	0.63	8.33

Large Systems Up 2.29%

ASE	20.63	11.63	Amadahl Corp.*	17.75	0.75	4.41
NYS	12.75	7.50	Control Data Corp.	12.00	0.00	0.00
NYS	19.25	8.88	Convex Computer	9.25	-0.25	-2.63
QTC	19.63	11.63	Cray Research Inc.*	18.88	-0.13	-0.62
NYS	52.25	31.50	Data General Corp.	38.88	1.38	3.57
NYS	22.50	8.00	Digital Equipment Corp. (L)	9.13	-0.13	-1.35
NYS	71.75	43.50	IBM*	45.38	-0.63	-1.36
NYS	107.38	81.63	Matsumita Electronics	93.13	-2.38	-2.62
NYS	128.00	93.50	Pyramid Computer (L)	107.00	0.50	0.47
QTC	25.25	10.50	Sequent Computer Sys.	11.50	0.75	6.98
QTC	17.88	7.50	Sequoia Systems Inc.	11.88	0.25	2.15
QTC	18.38	10.13	Sirius Computer Inc.*	16.25	1.13	7.44
NYS	54.25	27.25	Sirius Computer Inc.*	48.50	2.13	0.27
NYS	17.63	9.50	Tandem Computers Inc.*	13.50	-0.38	-2.70
QTC	3.88	1.13	Tandon Corp.	1.69	0.31	22.76
NYS	11.75	3.25	Unisys Corp.*	10.13	-0.38	-3.87
ASE	7.50	0.00	Wang Labs Inc. (b)	3.88	0.13	3.33

Software & DP Services Off 0.01%

QTC	68.50	37.50	Adobe Systems Inc.	46.75	3.25	7.47
QTC	13.25	5.50	Al Corp.	7.00	0.13	1.82
QTC	54.50	19.00	American Software Inc.	22.00	1.50	7.32
QTC	19.75	10.13	Ask Computer Systems	13.25	-0.75	-7.19
QTC	20.00	7.50	Autodesk Inc.	14.50	-0.63	-4.13
QTC	62.25	23.25	Bachman Info. Systems	34.00	0.00	0.00
QTC	37.75	13.00	BGS Systems Inc.	14.00	0.00	0.00
QTC	42.50	25.88	BMC Software Inc.	36.25	0.00	0.00
QTC	79.00	33.50	Book & Software	47.00	-4.75	-8.18
QTC	20.50	39.00	Boydell Int'l Inc.*	0.00	0.00	0.00
QTC	86.75	39.50	C&E Software	48.63	-0.88	-1.83
ASE	11.25	4.75	Cognos Inc.	5.00	-0.25	-4.76
QTC	20.38	7.50	Cognos Inc.	11.25	0.38	3.23

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QTC	4.25	1.13	Ball Atlantic Corp.	42.25	-0.13	-0.09
NYS	50.63	40.25	Bell Atlantic Corp.	43.50	-0.88	-1.97
NYS	52.63	43.38	Bellsouth Corp.	48.75	-0.25	-0.51
NYS	9.38	4.75	Bit, Beranek & Newman	5.38	-0.38	-4.52
NYS	65.88	50.25	Cabletron Systems	40.88	0.75	1.91
QTC	31.00	11.75	Chippm Corp.	24.63	-2.88	-13.22
QTC	43.63	13.88	Cisco Systems Inc.	38.75	1.88	5.08
NYS	35.25	13.75	Combridge Labs Inc.	-0.63	0.10	1.16
QTC	4.63	1.25	Data Switch Corp. (L)	1.50	-0.06	-4.03
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QTC	10.88	4.50	Digital Systems Int'l Inc.	11.50	0.25	2.22
QTC	37.50	13.50	Flanet Corp.	4.63	-0.19	-3.91
QTC	8.88	3.63	Fibronix Int'l Inc. (L)	5.13	-1.13	-18.00
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NYS	49.25	35.00	Northern Telecom Ltd.*	38.00	-2.88	-7.03
QTC	65.00	22.63	Novell Inc.*	52.38	-1.63	-3.01
NYS	38.88	32.88	Nyx Corp.*	77.00	-0.13	-0.16
QTC	37.50	16.50	OcTel Communications Corp.	24.25	0.75	3.19
QTC	9.88	5.63	Penn Data Comm. Ntwks.	5.88	-0.63	-9.62
QTC	53.00	20.50	Proton Inc.	38.75	1.75	4.73
QTC	18.75	9.75	Proton Inc.	13.50	1.38	11.34
NYS	19.75	11.63	Scientific Atlanta Inc.	16.75	0.25	1.52
NYS	49.00	49.00	Southwest Bell Corp.	40.88	-0.13	-0.42
NYS	31.50	20.75	Sprint Corp.	24.50	0.50	2.08
QTC	42.25	14.25	Synopsis Communications	25.13	2.38	10.44
QTC	41.25	21.25	US West Inc.	35.63	0.00	0.00
QTC	41.25	21.25	Wellfleet Communications	31.00	-3.50	-10.14

PC Workstations Up 4.61%

Research	7.25	0.25	3
Inc.*	62.00	2.75	4
Inc.*	18.88	2.25	13
	12.13	0.00	0
Computer Corp.*	25.13	1.88	8
Corp.	28.00	2.50	9
Inc.	5.88	0.00	0
	28.13	-0.63	-2
Co.*	80.63	0.75	0
Systems (L)	9.13	0.88	10
	18.00	1.13	6
ms Inc.*	29.75	1.75	6
	28.25	0.38	1
CS	8.13	0.63	8
al Ltd.	10.00	-0.25	-2

COMPUTER INDUSTRY

IN BRIEF

Lotus loses three execs

■ Three Lotus CC:Mail executives, including Philippe Courtot, who was president of CC:Mail before it was acquired by Lotus Development Corp. last year, have resigned. Their departure appears to be the result of a disagreement over product direction, although Lotus described it as a natural fallout after an acquisition. Lotus will replace Shelly Harrison, a marketing director, and Eric Hahn, who headed up CC:Mail development. The company will not replace Courtot, who also held a vice president position.

■ IBM last week consolidated its North American sales and marketing organizations under one umbrella. IBM Corporate Vice President Robert LaBant now heads a newly formed entity, IBM North America, which combines IBM Canada Ltd. with IBM's U.S. sales and marketing unit. The group was formed to better respond to customers that have operations spanning the continent, according to an IBM Canada spokesman. No layoffs are expected, he added.

■ The boards of Silicon Graphics, Inc. and Mips Computer Systems, Inc. last week approved amended terms of their merger agreement. The agreement calls for an exchange of each Mips share for 0.52 Silicon Graphics share.

■ Computer Sciences Corp. (CSC) last week posted fourth-quarter net profits of \$23.7 million, up 12% from the year-earlier period. Revenue increased 35% to \$644 million, fueled partly by the firm's megaoutsourcing contract with General Dynamics Corp., which began Nov. 2, 1991. For fiscal 1992, CSC earned \$68.2 million on revenue of \$2.1 billion, a 22% increase from 1991.

DEC tightens CASE links with Andersen

Will market consultancy's installation tool for VAX/VMS under Cohesion blueprint

BY KIM S. NASH
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. last week launched a plan to puff life into its computer-aided software engineering (CASE) framework strategy that involves reselling a development tool from Andersen Consulting.

DEC said it will immediately start reselling, under its Cohesion blueprint, Install/1 for VAX/VMS, a code generator that is part of Andersen's Foundation CASE tools.

Cohesion, like rival IBM's AD/Cycle, is a plan for setting tool and methodology standards to let developers use CASE products from different vendors to build large-scale applications.

Unknown factor

DEC has sold 10,000 licenses for CDD/Repository, the centerpiece of Cohesion, since the storehouse was introduced last December. But it is unclear

whether those users are developing major applications with Cohesion products, a DEC spokesman said. Foundation, meanwhile, is installed at 750 sites worldwide, an Andersen spokesman said.

Although the Chicago-based consulting firm has been a cooperative marketing partner since the introduction of Cohesion two years ago, Install/1 is the first Andersen product to be resold by DEC.

"This probably will give Cohesion a boost because Andersen and DEC have strong marketing power. They'll get the word out a bit better than it already is," said Andrew Topper, president of Foresite Systems, a CASE consultancy in Okemos, Mich.

DEC appears to be mucking through the same bureaucratic roadblocks bogging down AD/Cycle. Cohesion did not lack code-generation products before the Andersen deal, but user interest in the strategy has waned, analysts said.

AD/Cycle and Cohesion "are such big, big strategies, and they've each got several hands stirring the pot that it's hard to get anything done. Users perceive no progress," said Aaron Zornes, application development analyst at Meta Group, Inc., based in Westport, Conn.

Cortex Corp., a \$9.4 million third-party DEC software supplier in Waltham, Mass., is expected to unveil a similar reselling deal within two weeks, according to a source close to Cortex. Corvison 5.0, an upgrade of Cortex's application generator introduced last week, will be jointly sold by DEC and Cortex, the source said. DEC would not comment.

Buddy system

However, DEC will apparently have to rely on other Cohesion partners, such as Cortex, Cognos, Inc. or Smartstar Corp., to stir interest in Cohesion because Andersen "probably won't ... let DEC sell other Foundation

products in the near term," according to Rosemary O'Mahoney, partner and head of the alliance with DEC.

To do so would mean porting the other Foundation modules — Design/1, Method/1 and Plan/1 — to VMS, which O'Mahoney said is not currently on Andersen's agenda. These pieces now run on personal computers, IBM mainframes and Bull HN Information Systems, Inc. minicomputers and mainframes.

"Clearly, DEC is trying to get the ball moving again," Zornes said.

Sparking interest in Cohesion or any other grand CASE scheme will be tough, Topper said. In general, CASE sales and significant product introductions have stagnated for the past 18 to 24 months, he said.

"It's probably a combination of the down economy and the fact that the CASE/user love affair is over, but the market looks dismal," Topper said.

Ideas seeds start-ups for high-tech hothouse

BY MITCH BETTS
CW STAFF

COLUMBIA, Md. — At a time when venture capital for high-tech entrepreneurs is said to be scarce, a little-known company here is building a technology incubator. Ideas, Inc. has acquired an eclectic mix of start-up companies, providing them with requisite financial capital and administrative support to sprout roots and grow.

Just last week, the company added Granite Communications, Inc. in Amherst, N.H., to its collection. Granite is a spin-off from Japan's Murata Machinery Corp. that has just introduced wireless, handheld data terminals for service personnel.

Ideas is backing Granite with an unusual "reverse venture capital" arrangement. In a typical venture capital deal, the financier makes a small up-front investment that grows as certain

objectives are met. "Our arrangement with Ideas is the reverse," said Larry Sullivan, executive vice president at Granite.

"Ideas has committed all of our funding up front, and as we meet performance requirements, we increase our equity position," Sullivan explained.

Ideas has either acquired or internally developed nearly a dozen companies since its founding in 1970 — often selling them years later for a handsome profit.

For example, it started an electronic cash register business in 1976 — Micros Systems, Inc. in Beltsville, Md. — and sold it in 1988 for \$40 million. Other companies in the Ideas stable include Lanex Corp., which is in the local-area network market here, and Advanced Communications Systems, Inc. in Gaithersburg, Md., which makes electronic tagging systems.



Ideas' Barrett: 'We don't give up easily'

Ideas, a private, employee-owned company, had just \$31 million in 1991 revenue, but it is a cash cow ready for a new round of acquisitions, according to Donald W. Barrett, president and chief executive officer.

The goal, Barrett said in a recent interview, is to evolve into a systems integrator that serves government and commercial users.

Since Barrett joined the company in mid-1991, Ideas has started a commercial systems integration unit to supplement its government work and has acquired a company specializing in network management software, now called the Strata Group.

Barrett said the key to making the start-ups successful is to keep the entrepreneurial team in place and give it financial stability and a business infrastructure. "We try to get them to the break-even point quickly — in 12 to 18 months. And we don't give up easily," he said.

Ideas typically acquires a company division that has been deemed a "nonstrategic" appendage by its former parent. "A nonstrategic unit usually gets starved for capital so it underperforms. We put a little fertilizer on it," Barrett said.

As for future acquisitions, Ideas is looking at expanding its presence in both commercial and government systems integration, he added.

Retailer buys service unit

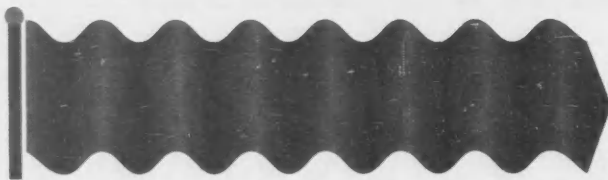
PLEASANTON, Calif. — ComputerLand Corp. continued its transition from computer retailer to service last week, disclosing an agreement to acquire TRW, Inc.'s customer service division.

The TRW division would give ComputerLand a service business worth \$280 million. ComputerLand officials said the acquisition, along with the buyout last June of Nynex Business Centers, bumped up its service presence among the Fortune 500.

"I think it's a very natural sort of key strategy," said William Tauscher, ComputerLand's chief executive officer. "It's the next step in the transition of ComputerLand from a convenience retail model to a service-oriented firm."

Tauscher said any staff reductions would come from redundancies within the corporate staff. He emphasized that there will be no reductions in the field operations.

Al Andrus, senior vice president of service and support at ComputerLand, said, "TRW has a deep experience base in its people. The number of new relationships will complement our sales and service efforts."



Apropos
An apt name for a PC
maker hawking Unix:
Doug Pushard,
Unix systems manager
at Compaq

I ♥ MY STORAGE SYSTEM

Users of Storage Tek's 4400 Automated Cartridge Systems, which handle 18-track cartridges, have taken to naming their systems. Here's a sample: **Hans Freeloader**, Bank of Hawaii; **Mount Neverrest**, Scandinavian Airline System; **Larry, Darrell, Daryl**, state of West Virginia; **Robotriever**, Boeing Aerospace & Engineering; **ATLAS** (Automatic Tape Loading and Storage), Pennsylvania Blue Shield; **Tape Ape**, Bank of America.

QUIPS & QUOTES

H. Ross Perot, billionaire businessman and presidential wanna-be, on the future:

Q. What one thing do you feel will not change in the next 200 years?

A. Human nature

Q. What, in your opinion, should change the most in 200 years?

A. Technology

► Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.



Buff-er

On a list of what to bring to the Digital Consulting, Inc. Pen-based Computing Conference:

- Check
- Reservation confirmation
- Business cards
- Clothing

Chid you reminded us of that last item.



Sources: "The Smith & Shows Letter"; *The Farmer's Almanac*, 1992

*In the
"This takes the
cake" department of
PR ideas:*

◀ John Lohmeyer, NCR standards architect, celebrates the 10th birthday of the Small Computer Systems Interface, or SCSI.

AKA

The following topologies are best known by their generic titles. But they've also been given aliases:



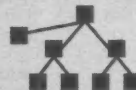
Official name: Ring
Pseudonyms: UFO, Rotary



Official name: Star
Pseudonyms: Octopus, Flakenet



Official name: Bus
Pseudonyms: Double-Sided Toothbrush, Schwarzenetwerk



Official name: Tree
Pseudonyms: Out in Left Field, Stretching Spider, Necktie on a Windy Day



Official name: Mesh
Pseudonyms: Dyslexinet, Netangst, Squashed Praying Mantis

INSIDE LINES

Ought to be in pictures

► Negotiations that could reportedly lead to IBM investing up to \$500 million in Time Warner could give Big Blue a leg up in outsourcing opportunities at the media giant. At least that's what one executive at IBM's ISSC outsourcing subsidiary said last week after reading about the negotiations in last Friday's *Wall Street Journal*. "Multimedia is an area we'd eventually like to do a lot in," the ISSC executive said.

Pen-tops spread

► Grid's Kirk Cruikshank told attendees at the Pen-based Computing Conference in Boston last week that Grid intends to come out this year with a pen-top system — one that combines keyboard and a pen interface. Zenith Data appears to be working on such a product as well: It recently hired Grid's pen-top product manager to direct an unnamed effort.

Sticks and stones

► John Kish, director of Oracle's desktop products division, charged last week that Microsoft's Windows 3.1 cannot stand up to the rigors of cooperative processing. He claimed it crashes more than 10 times daily on the desks of some Oracle developers. Accordingly, Kish said, all Oracle tools will be ported to 32-bit Windows NT — not 16-bit Windows 3.1 — from now on.

Microsoft countered that Kish's comments reflected poorly on Oracle's efforts. Dwayne Walker, Microsoft's director for Windows NT and networking products, said Oracle's problems might end when Microsoft's "Win 32" development kit ships in July, providing a single 32-bit API for both Windows 3.1 and Windows NT.

Doing its own thing

► Sybase plans to announce later this month a NetWare Loadable Module (NLM) version of its SQL Server 4.2 RDBMS for Novell LANs. But Sybase, which designed Microsoft's SQLServer for OS/2, will market the NLM on its own. Drawn by NetWare's speed and popularity, Sybase joins Oracle and Gupta as the only independent providers of a database NLM.

Dualing buses?

► One source close to IBM said the firm is talking about building PC systems that run both the AT bus and the MCA bus. Other analysts and sources at IBM said they were not sure what the company might hope to gain from this — if it does it at all — but speculated that it could possibly allow AT users to move to the MCA bus and retain their old peripherals.

Boxing week

► A parade of new boxes will emerge from Palo Alto, Calif., next week, as Hewlett-Packard has scheduled several introductions ranging from its proprietary and open minicomputers down through the PC level.

Watch for an overhaul of the HP 3000 and 9000 line and for PCs built on Intel's 486DX clock doubler.

Texas hoedown

► Insiders at Texas Instruments confirmed that it recently shuffled high-level executives within the software group, particularly in the CASE area. The changes will reportedly throw a bigger light on marketing the Integrated Engineering Facility (IEF) CASE tool set. TI corralled some dispersed development projects being done with IEF into the CASE group. With these works-in-progress came associated engineering and marketing staff. "We just about tripled the size of IEF," one source said. The group's budget was also beefed up to pay for an undisclosed number of new sales and technical workers, particularly Unix people — no doubt to help fulfill the firm's promise to unveil a Unix-based version of IEF this year.

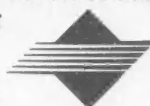
Ted Standish, Gillette North Atlantic Group's director of IS, told Pen-based Computing Conference goers that any company investigating using pen computers should initially expect the worst. "People have literally driven over them," he said, detailing some of the unexpected ways the systems "crashed," so to speak, early in Gillette's pilot project. Got any other systems crash tales of woe? Phone, fax or Compuserve News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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